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ABSTRACT

The purpose of this study was to examine the way financial factors affect student enrollment decision-making at two points: (1) expectations about financial factors before a student chooses a college--those things that affect college choice decisions such as low tuition have a direct effect on subsequent college decisions; and (2) financial factors that affect student enrollment behavior after they have enrolled--having experienced the actual dollar amounts that have direct effect on subsequent persistence decision. This study used data from the National Postsecondary Student Aid Study and adapted a logical model developed by St. John. The statistical method used for the data analysis was logistic regression. Results indicated that: (1) full-time students of traditional and non-traditional age were the group of students with the least sensitivity to tuition; (2) on average, each $1,000 increase in tuition reduced the probability of persistence of full-time students by 29%, while part-time students on average were reduced by 69%; (3) among both full-time and part-time students, those of non-traditional age were somewhat more tuition sensitive; and (4) African Americans were found to be more likely than whites to persist through part-time attendance. (Contains summary of findings with comments, glossary of pertinent terms, appendix with coding information, 4 tables, and over 200 references.) (MKF)

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ED 459 884

THE FINANCIAL NEXUS BETWEEN COLLEGE CHOICE AND PERSISTENCE FOR COMMUNITY COLLEGE STUDENTS:
A FINANCIAL IMPACT MODEL

A Dissertation

Submitted to the Graduate Faculty of the
University of New Orleans
in fulfillment
of their Requirements for the degree of

Doctor of Philosophy
in
The Department of Education Administration,
Counseling, and Foundations

by

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May 2000

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Abstract

Families today are increasingly burdened with the responsibilities of paying for rising costs of tuition. Community colleges have become attractive and more affordable when compared to the costs of a four-year college (Fine, 1998). This has resulted in enrollment shift, which has a direct negative impact on choice and persistence on the groups of people most likely to attend (America's access institutions) community colleges--students from lower-income and minority groups. (Cohen & Brawer, 1996).

The purpose of this study was to examine the financial nexus between college choice and persistence at community colleges.

The theory used in this study was the nexus construct developed by Paulsen and St. John (1997). The essence of the nexus is that it affords researchers the opportunity to consider for the first time the way financial factors affect student enrollment decision making at two points: (1) Expectations about financial factors before a student chooses a college, those things that affect college choice decisions such as low tuition have a direct effect on subsequent college decisions. (2) Financial factors that affect student enrollment behavior after they have enrolled--having experienced the actual dollar amounts which have direct effect on subsequent persistence decision. This is the first study to apply the nexus construct to community college population; the first to examine full- and part-time, traditional- and non-traditional-age students separately, and the first to examine the tuition-sensitivity within all groups of community college students.

This study used data from the National Postsecondary Student Aid Study (1987) and adapted a logical model developed by St. John (1989). The statistical method used for the data analysis was logistic regression.

The results of this study found that full-time students of traditional and non-traditional-age were the group of students with the least sensitivity to tuition. On average, each $1,000 increase in tuition reduced the probability of persistence of full-time students by 29.5 percent, while part-time students on average were reduced by 68.6 percent. Among both full-time and part-time students, those of non-traditional-age were somewhat more tuition-sensitive. Additionally, African-Americans were found to be more likely than Caucasians to persist through part-time attendance.

CHAPTER ONE

Introduction

Higher education today faces a difficult and uncertain future as the new century begins. Throughout much of the post-World War II era, higher education was a rapid growth industry, experiencing large gains in resources and enrollment. Community colleges, in particular, increased in number and size at an exceptional rate. The total grew from 654 colleges in 1965, constituting thirty percent of the total number of institutions of higher education in the United States, to 1,350 community colleges, constituting forty percent of all institutions of higher education (Adelman,1992). Such institutions have greatly helped to carry out society's commitment to increased post-secondary educational opportunity (Breneman & Nelson, 1981). For example, in 1965, community colleges enrolled twenty-four percent of all first-time college freshmen, and twenty percent of all students at all levels of higher education. This included graduate and professional schools. Today, it is a multi-purpose institution, attracting students with a wide variety of interests and needs. They enroll over fifty percent of all first-time college freshmen and over thirty-seven percent of all students enrolled at all levels of higher education (Adelman, 1992; Grubb, 1995a).

Historically, the community college has had several functions. While its priorities have shifted over time, its distinguishing features of accessibility and versatility have remained central to its mission (Cohen & Brawer, 1996). Its associate degrees and certificates in career programs prepare students for immediate employment, yielding substantial individual and societal gains, thereby supporting the value of promoting persistence and an understanding of what factors have positive influences on it (Geske & Cohn, 1998; Paulsen, 1998). Lewis, Hearn, & Zilbert (1993) found that for students who had not attended a four-year institution, participation in postsecondary vocational education for at least six months resulted in substantial and significant increases in earnings, particularly for women and those in the lowest quartile in terms of socioeconomic status.

Despite these individual and societal gains, in the past two decades, there has been a fundamental change in the way the federal government finances higher education because of changes in the nature of federal aid programs and a reduction in the purchasing power of federal student aid awards. These policy changes, in combination with rapid rates of tuition inflation, have led policy analysts to conclude that shortfalls in federal student aid funding have caused a great increase in the expenditures for institutional student aid (Frances, 1990; Hauptman, 1990a). Since 1980, tuition charges have consistently increased at a rate greater than that of inflation. State support of higher education wavered because of troubled state economies, and the federal government shifted its emphasis from grants to loans and decreased its support for student aid (McPherson, & Schapiro, 1989; Paulsen, 1991; St. John, 1991). As a result, a larger portion of the burden of paying for college has shifted from the public to students and their families (Breneman & Finney, 1997).

Consequently, community colleges became increasingly attractive and more affordable in terms of cost to those families making twenty thousand dollars or more, when compared to costs of the traditional four-year college. This shift, however, had a direct negative impact on choice and persistence on the groups of people most likely to attend community colleges-that is, students from lower-income and minority groups (St. John & Starkey, 1994). The coming together of all these variables, such as choice, persistence, cost and aid, as it relates to community colleges, will be the nexus, as broadly defined for the purpose of this study. The focus of this study is on how these changes in the cost of college have influenced the financial nexus between college choice and persistence among students attending community colleges.

Background of the Study

This study addresses a void in the literature because there is no known research in the area of the financial nexus between college choice and persistence by community college students. This study offers a theoretical perspective that can help institutional researchers and administrators gain additional insights into the influence of costs (tuition, housing, and food) and financial aid (grants, loans, and work study) on the enrollment behavior of their students. A high percentage of students that enroll in two-year colleges have low rates of persistence toward the baccalaureate degree (Pascarella & Terenzini, 1991), creating a significant concern in promoting equal educational opportunities.

Research shows consistently that education in general, and postsecondary education in particular, is a direct investment in the future of humankind. The benefits of education have a massive impact on critical problems that plague society. Education makes a difference in the lives of people, it promotes economic growth, social progress, and more enlightened citizens (Bowen, 1977; Paulsen, 1996a, 1996b). The earning differentials between college and high school graduates have increased substantially since the mid-1970s. College graduates earned about thirty-eight percent more than high school graduates in the 1970s and this has increased to fifty-eight percent in the 1990s. (Paulsen, 1998). However, even with such benefits, there has been a major change in higher education finance in terms of the roles of the federal and state governments within the last twenty years (McPherson & Schapiro, 1991, 1998; Slaughter & Leslie, 1997; St. John, 1994).

Today, the federal government uses loans as the primary engine in promoting postsecondary education for those who need assistance. Assistance is generally needs based and it comes in various forms such as work-study, grants and loans. The increased use of loans began in the 1980s, which represents a major shift from the use of grants in fostering postsecondary opportunities (College Board, 1997). State funding and support for public colleges and universities have been on a downward trend, resulting in increases in tuition charges since the 1980s (Mumper, 1996; Paulsen, 1991). Theorists and researchers purport that these increases appear to have influenced students in choosing whether to attend a two-year community college or a four-year college (Kane, 1995; McPherson & Schapiro, 1998). Therefore, it is important for federal and state policy makers, institutional researchers, and college administrators to understand the role of finances in the choice and persistence decisions of college students. Above all, it is especially important to understand the financial nexus between college choice and persistence decisions among community college students, because about fifty percent of all first-time freshman students attend and are already experiencing the financial nexus at community colleges, by having made the choice to enroll because of some expectations of financial variables and also having made the decision to re-enroll for a second semester after experiencing the financial variables (Cohen & Brawer 1996;

Paulsen & St. John, 1997).

For the purpose of this study, choice-making is defined as a series of activities which an individual engages in to select one opportunity from another. Choice-making is a life-long process. College students frequently make many important choices at different points during their postsecondary education. They exercise the freedom to choose to attend or not to attend an institution of higher learning; what type of institution to attend; whether to live on campus or off campus; whether to attend full-time or part-time; what field of study to enter in terms of a major and a minor; and, what professors to take courses from and which to avoid, if possible. Later, they are often again faced with the choice of whether to drop out, stop out, transfer, or continue their enrollment and studies (Paulsen, & St. John, 1997).

Research on the patterns of choice and decision-making behavior, especially as it relates to the reasons why students choose to attend a community college, has seldom considered the dimensions of initial commitments that could influence subsequent persistence processes and outcomes. However, research studies have only been conducted with four-year colleges, examining the influence of finance-related reasons for choosing a college and persistence decisions among college students in four-year institutions and the examination of the nexus between college choice and persistence (Paulsen & St. John, 1997; Paulsen, St. John, & Starkey, 1995; St. John, Paulsen, & Starkey, 1996).

Most of the studies on college-choice have been used to inform marketing and recruitment practices (Braxton, 1990; Clark & Hossler, 1990; Paulsen, 1990) and persistence research has been used to inform retention practices (Astin, 1975; Bean, 1990a, 1990b; Tinto, 1987). Hence, these areas of research represent two separate lines of theory and inquiry for student college choice and student persistence, and correspond to two separable features of enrollment management. However, most comprehensive discussions of enrollment management in higher education have begun to assume a link between student recruitment and retention (Hossler & Bean, 1990; Hossler, Schmit & Vesper, 1999).

Theories of "college choice" typically provide explanations of why a potential student chooses to enroll in a college and which college the student attends (Jackson, 1978; Manski & Wise, 1983; Paulsen, 1990; Zemsky & Oedel, 1983,). Theories of "persistence" commonly provide explanations of why an enrolled student chooses to re-enroll or continue his or her educational program during the next semester or year (Astin, 1975; Bean, 1980; Pascarella & Terenzini, 1980; Tinto, 1997).

The financial "nexus" between college choice and persistence is a new theoretical construct that focuses on the dynamic interplay between students' choice and persistence decisions (Paulsen & St. John, 1997). Recent empirical work has examined the influence of a set of college-choice variables related to the financial reasons why students choose a college among four-year institutions. The financial nexus focuses on these college-choice variables, and the financial variables that constitute the actual dollar amounts of financial costs and aid students experience at the time of subsequent persistence decision, as well as the interactions between both college-choice and financial variables on whether students stay in their college of choice--that is, their persistence behavior.

Research on the financial nexus has examined the experiences of students at four-year colleges (Paulsen & St. John, 1997, 1999; Paulsen, St. John, and Starkey, 1995; St.

John, Paulsen & Starkey, 1996), but the nature of the financial nexus for students attending community colleges has not yet been examined. This is especially important today because community colleges are playing a pivotal role in postsecondary education in the era of the welfare to work programs. It is important to note that students attending community colleges achieve substantial and significant increases in their income, even with only six months enrollment participation in comparison with those who have not participated in any sub-baccalaureate education (Grubb, 1990a; Lewis, Hearn & Zilbert, 1993; Paulsen, 1998). This study will bridge this important gap in current literature by examining the interactions of financial, choice and persistence variables on enrollment--a topic that is important to institutional and state policymakers, given the financial exigencies facing most states. In fact, there were more than 14.3 million students enrolled in postsecondary education with a graduation rate of about 57 percent in the Fall of 1994 (U.S. Department of Education, 1994). Even a small percentage gain in persistence would have huge impacts on a lot of people, particularly community college students. Therefore, looking at the volume of students who must make the choice and persistence decisions and multiplying the opportunity for increased educational attainment over time is a compelling reason for this study.

Statement of the Problem

The financial nexus between college choice and persistence for community college students is a phenomenon that has not been investigated. Research on this subject is necessary in order to develop policies that can assist the community college students themselves, the institutions of higher education they attend, and policymakers, toward the development of society as a whole, to gain insights into the influence of costs (tuition, housing, and food) and financial aid (grants, loans, and work study) on the enrollment behavior of community college students. As higher education moves from the 1990s into the next millennium, there is a great need for families to understand the connections between student aid, college choice, and persistence and the relationships of these factors to their family incomes. Loan aid has increasingly been a dominant factor in the financing of a college education. Researchers have reported that "federal student loan volume is exploding, and many students now graduate from private college owing as much as $30,000" (Graham, 1994, p.1).

Research has also shown that parents and students are being forced to assume a greater share of the burden for financing higher education due to shift in federal student aid policy (Hansen, 1991). This has made community colleges attractive when the cost of attendance is compared to the cost of attending four-year college. Researchers express their concern that the persistent increases in tuition will decrease the capacity of students from lower socioeconomic backgrounds to finance college attendance in general, and attendance at the high-cost institutions in particular, limiting access among students of lower socioeconomic status (St. John, Paulsen, & Starkey, 1996). This will cost society, will result in a lack of skilled workers needed to stimulate and develop sound economic growth, and could result in increases in welfare benefits. Therefore, the need to understand the interactions between students' pre-college expectations about financial factors that influence choice and their post-college financial experiences and the way these interactions influence persistence decisions is imperative. This is especially important because over fifty percent of the nation's freshman students are enrolled at community colleges, therefore a small gain in understanding how to keep these students in college and increase matriculation rates that can lead to increased educational attainment, provides a compelling reason for this study.

Purpose of the Study

The purpose of this study is to examine the financial nexus between college choice and persistence at community colleges. The framework for this study will be an adaptation of the construct and model of the financial nexus between college choice and persistence decisions which was developed and tested based on the experience of students attending four-year colleges (Paulsen & St. John, 1997, 1999; Paulsen, St. John, & Starkey, 1995; St. John, Paulsen, & Starkey, 1996). This study will examine the influence of a set of college-choice variables related to the financial reasons why college students choose a college. It also examines the effect of the actual dollar amounts of financial variables at the time of a persistence decision on whether or not students decide to stay in their college of choice. A sub-sample of community - college students from the National Postsecondary Student Aid Study of 1986-87 (NPSAS-87) will be used to explore this relationship.

Since 1980, federal financial aid policies have made a substantial shift away from grants toward much greater reliance on loans, a trend that has continued through the 1990s. This positions the NPSAS-87 survey almost in the middle of this policy change period and therefore, makes it particularly appropriate for the purpose of this study. This data base has been employed primarily in studying the effects of financial factors on persistence decisions of college students by selecting variables for study based on earlier economic and sociological models (Andrieau & St. John, 1993; Hippensteel, St. John & Starkey, 1996; St. John, Andrieau, & Oescher 1994; St. John. & Starkey, 1995). However, research on this data base has only recently been used to study the financial nexus between college choice and persistence.

According to Paulsen and St. John (1997), the interaction between finances, academic and social experiences are integral in the calculations students make about costs and benefits of their college experience. They further concluded that financial calculations, as well as academic and social considerations, not only influence the initial enrollment decisions of a large percentage of students, but these calculations also influence subsequent persistence decisions. And, when re-enrollment decisions are made by students, they calculate whether the quality of their college experience was worth the cost.

This is especially important to the community college environment, because students of lower socio-economic status constitute a disproportionately large share of the enrollment at such colleges (Kane, 1995; McPherson & Schapiro, 1998; Paulsen, 1998). For many students, community college offers the only real chance to learn skills that will allow those that have made the choice to go there to achieve a better life for themselves and their children. It serves as the engine in developing people for a quick entrance into the work force. This is critical for many who may otherwise not have the opportunity to pursue higher education (Kane & Rouse, 1995; Lewis, Hearn & Zilbert, 1993; Paulsen, 1998). The role of the community college system is also critical to the economy in America. In the next decade, it is projected that community college will experience an upswing in enrollment (Cohen & Brawer, 1996).

Halstead (1996) further expresses the importance of community colleges for so many people when he refers to tuition at community colleges as the "access tuition." He uses this as his measure of the accessibility of public higher education in his state-to-state comparisons. This is because community colleges accept any individual who decides to enroll regardless of age, offers a variety of courses in almost anything, and it is the cheapest form of higher education today.

Other research findings have established that traditional and non-traditional college-age community college students are highly responsive to tuition charges, and that available grant dollars are not sufficient to mitigate the negative influence of tuition on persistence (Hippensteel, St. John, & Starkey, 1996; St. John & Starkey, 1994). This is very troubling considering the current cost provisions for federal financial aid programs and the unwillingness of the general public to pay more taxes. The unwillingness of the general public to pay more taxes to support community colleges has resulted in increases in tuition at these colleges in recent years. This defeats the philosophy of the community college movement in the United States--since its inception--of low-tuition, low-aid. Consequently, access for the very poor may be reduced.

Research Questions

This study will examine four categories of research questions:

1. What is the effect of the importance (perception) of financial variables at the time of a college choice decision on subsequent persistence decisions of community college students?

2. What is the effect of the actual dollar amounts of financial variables at the time of a subsequent persistence decision on persistence of community college students?

3. What is the nature of the interaction between college-choice and financial variables in the persistence of community college students?

4. What are the effects of selected background, college-experiences, and postsecondary aspiration variables on the persistence of community college students?

Significance of the Study

The absence of research on the linkages of financial factors, choice and persistence in community colleges creates a recognizable gap in the persistence literature. This study will fill that gap in the literature by answering question related to how community college students experience the financial nexus. Over fifty percent of the nation's first-time freshman students are experiencing the nexus in community colleges (Cohen & Brawer, 1996; Grubb, 1995a). Yet, this phenomena has never been examined. Low and lower-middle income students are disproportionately represented in community colleges (McPherson & Schapiro, 1998). These students are much more price sensitive than any other group (Heller, 1997; Paulsen & St. John, 1999); another factor supporting this study's significance.

Concerns about the economy, escalating costs of four-year institutions, and caps on state college enrollments have made many high school graduates look to community colleges where they can complete their freshman and sophomore years at a fraction of the cost (Cohen & Brawer, 1986). Policy makers, financial aid personnel, enrollment management and other college administrators need to have a better understanding of the interaction of financial variables on choice and persistence. Why students choose to attend a community college and their subsequent re-enrollment decisions to continue to attend or drop-out, and or to stop-out or transfer to another institution, are critical planning, recruitment and retention issues for colleges and universities. Understanding this phenomena, will help colleges and universities to plan with greater comprehension of how financial variables effect student decision making. These institutions may also use this information to develop critical alternative finance strategies for this population.

Heller (1997) found that lower-income students are more sensitive to increases in tuition and decreases in financial aid in comparison with higher-income students. Hence, the diminishing capacity of federal and state financial assistance programs to offset the growing increases in tuition costs since 1980 raises critical questions regarding possible reductions in equity of access and college-choice in higher education (Heller, 1997; McPherson & Schapiro, 1998; Paulsen, 1998), making this study timely and important.

Theoretical Perspective

The theory that will be used in this study is the "financial nexus" between college choice and persistence. It is a relatively new approach. This theory offers a fresh approach to administrators, researchers and policy makers and provides them with a new lens and insight into the examination of the influence of costs (tuition, housing, food and other living costs) and financial aid (grants, loans, and work study) on the enrollment patterns and behavior of college students (Paulsen, & St. John, forthcoming; Paulsen & St. John, 1997; Paulsen, St. John, & Starkey, 1995; St. John, Paulsen, & Starkey, 1996). The "financial nexus" theory is unique, in that it combines "persistence" decision models (Bean, 1990B; Cabrera, Castaneda, Nora & Hengstler, 1992; Pascarella & Terenzini, 1991) and "college-choice" decision models (Hossler, Braxton & Coopersmith, 1989; Paulsen, 1990). This combination offers explanations about the factors that determine students' persistence decisions (Astin, 1975; Bean, 1980; Pascarella & Terenzini, 1980; Tinto, 1987), and the factors that determines whether a potential student chooses to go to college and which college he or she attends (Jackson, 1978; Manski & Wise, 1983; Paulsen, 1990; Zemsky & Oedel, 1983).

These two models (choice and persistence) provide distinct enrollment management functions in the area of marketing and recruitment research (Braxton, 1990; Litten, Sullivan & Brodigan, 1983; Paulsen & St. John, 1997). The combination of features of the two existing models or approaches gave birth to the financial nexus theory, thus providing a wider lense for the examination of how student's expectations and perceptions of costs, when choosing a college, interact with the actual dollar amounts of prices and subsidies to influence subsequent persistence decisions (Paulsen & St. John, 1999). A significant number of students have expectations about these financial factors which can be important in calculating the cost-benefit ratio when making the choice of one college or another. The actual dollar amount of such factors are especially important and bear more weight in the re-evaluation of costs and benefits in subsequent persistence decisions. These educational decisions are viewed by Becker (1964) as economic choices. Hence, the financial nexus model has bridged the two models of student enrollment behavior (college-choice and persistence), that were once viewed as two distinct sets of behaviors in theory and research.

Current research on the financial nexus between college choice and persistence decisions showed that students' expectations about costs which play important roles at the time of a college choice or initial-enrollment decisions also affect students' subsequent re-enrollment persistence decisions. Consistent with earlier research, students' experiences with actual dollar amounts of costs continue to be important predictors of persistence decisions. However, research on the financial nexus further indicates that students' expectations or perceptions about costs at the time of college choice interact with their experience of actual costs in determining persistence decisions (Paulsen & St. John, forthcoming; 1997; Paulsen, St. John & Starkey, 1995; St. John, Paulsen & Starkey, 1996).

This study will adapt the framework of the financial nexus model developed by Paulsen, St. John and their colleagues to examine the financial nexus between college choice and persistence at community colleges. Furthermore, this study will use the National Post-secondary Student Aid Survey of 1987 (NPSAS:87), consistent with previous analyses utilizing the financial nexus approach, to critically look at the influence on persistence of both cost-related factors that students viewed as important in choosing a college and the prices and subsidies which students encountered at the time of subsequent persistence decisions at community colleges.

NPSAS:87 Database

The availability of the NPSAS:87 database provides an avenue to examine the financial nexus between college choice and persistence at community colleges and to answer other research questions related to within-year persistence. The NPSAS:87 database determined eligibility for inclusion in the study, to include public and private schools, non-profit and proprietary schools, two-year and four-year schools, Ph.D. granting institutions, and schools with only occupational programs of less than two years' duration (Smith, Garcia & Malitz, 1990). It sampled all college students in the fall of 1986, then followed up with student surveys in the spring of the same academic year. The total sample for NPSAS:87 consisted of forty-seven thousand (47,000) undergraduate, six thousand five hundred (6,500) graduate and four thousand two hundred and eighty (4,280) first year professional students (Korb, Schantz & Zimbler, 1989). The overall response rate was about seventy-two percent. The sample for the present study consists of four thousand and ninety-one (4,091) undergraduates enrolled in community colleges who responded to NPSAS:87.

Definitions

Some terms used in this study are defined here for clarity and to ensure a common understanding for the context.

Access. A concept used in education that provides an individual with the right to go to college if they desire with ease, regardless of the student's financial status.

Attainment. To succeed in completing an educational program resulting in the award of a certificate, diploma or degree.

Attrition. The reduction of the number of students enrolled in a postsecondary institution.

Background. A person's experience relative to ethnicity, gender, age, marital status, employment, education, dependent status and number of dependents a student may have.

Budget. The total cost a student has outlined as needed for going to a particular institution. This includes tuition, fees, and living costs.

Controllable-Cost. Costs that can be controlled by students by choosing to adjust their budgets by economizing.

Cost of Education. The total out-of-pocket expense that a student will incur while attending a college. It includes tuition, fees, books and living costs.

Dependent Student. A student who is reliant on the financial support from parent(s), spouse or guardians.

Direct Effects. The effects on persistence of financial reasons for choosing a college and the actual dollar amounts of aid and costs.

Drop Out. A student who chooses to withdraw or discontinue enrollment at an institution. The term "drop-out" will be used in this study to refer to a non-persister.

Ethnicity. In this study, students are categorized as African-American, Latino, Asian and White. The African-American category includes students who are descendants from Africa (any of the black racial groups). The Latino category includes Hispanics, Mexicans, Puerto Ricans, Cubans, Central or South Americans, or others of Spanish origin or culture, regardless of race. The Asian category includes students who have origins in or are from Japan, China, The Philippines, Korea, Vietnam, Thailand or another far eastern country. The White category includes those of European decent.

Financial Aid. Any type of student aid other than family support or self-help used in assisting or deferring the cost of community college attendance. Typically, this includes grants, loans, and work study.

Fixed-Cost. Costs which are set by institutions that can not be changed by an individual. Students have no control over this cost.

GED. The General Educational Development Diploma (GED) is an official state licensed diploma document issued to a student who has met state requirements for the equivalency of a high school degree.

Grant. A form of student financial aid that is need based and does not require repayment or employment. Scholarships that are awarded based on merit are termed as grants.

Independent Student. A student who is not reliant on financial support from parent(s), spouse or guardians.

Institution of Higher Education. A college or university established with the purpose of providing education beyond the high school level -- postsecondary. This study will only include two-year higher education institutions or community colleges.

Living Costs. The costs incurred in going to college which are related to housing, food, clothing, etc.

Loan. A form of student financial aid based on the economic needs of the student which require repayment. In the case of a loan, funds are advanced after a promissory note is signed, and repayment is required by the recipient under specific conditions. Sometimes, loans are given to the parent(s) of the student, if the student is dependent, and the loans are based on the ability of the parent(s) to support the student in college.

Persistence. Within-year persistence refers to the re-enrollment in the spring semester of an academic year after having been enrolled in the fall semester of that same academic year. If a student graduates or meets his/her educational goals without re-enrolling in the spring semester, the student is classified as a persister.

Price. The student's total cost of attendance minus the financial aid received by the student; often referred to as net price.

Price Response. The influence of prices and price subsidies on the probability that a student will persist, usually expressed as a percentage change in the probability of persistence per $1000 change in a price or price subsidy.

Price Subsidy. Any financial aid, either based on needs or based on merit, including grants, loans, or work-study which defrays the total price.

Public Institution. A higher education institution that is supported by public funds through taxation and which is controlled by publicly elected or appointed education officials.

Title IV Aid. The federal student aid which is provided through Title IV of the Higher Education Act of 1965. This includes the Pell Grant, Supplemental Educational Opportunity Grant (SEOG), State Student Incentive Grant (SSIG), College Work-Study, the Perkins Loan, and the Stafford Loans.

Tuition and Fees. The total amount charged to students by the college for instructional and support services.

Withdrawal. A student's decision to terminate active enrollment in a program at any given term.

Delimitations of the Study

This study will confine itself to the use of the National Post-secondary Study Aid Survey of 1987 (NPSAS-87). It will focus only on community college data which examines the financial nexus between college choice and persistence.

Limitations of the Study

This study will extend and adapt a model originally developed for analysis of the National Center For Education Statistics'(NCES)longitudinal studies to NPSAS:87 data base. Further, this study will adapt similar studies on the financial nexus between college choice and persistence in four-year institutions (Paulsen & St. John, 1999; Paulsen & St. John, 1997; Paulsen, St. John & Starkey, 1995, St. John, Paulsen & Starkey, 1996).

NPSAS:87 was a Fall 1986 sample and the study defined re-enrollment as any student being enrolled in the spring of 1987. Therefore, NPSAS:87 can only be used to study within-year persistence. Fall enrollment alone is not representative of all college students, and this may be somewhat problematic for two-year colleges that have students enrolling each enrollment period year-round (St. John, Oescher & Andrieu, 1992; Hippensteel, St. John & Starkey, 1996).

A possible limitation of this present study is that NPSAS:87 does not have information on student achievement in high school. However, because college and high school achievement are often highly correlated, the lack of such a measure is not particularly problematic (Hippensteel, St. John & Starkey, 1996). This study will further examine the influence of two variables related to high school completion, which have consistently explained significant portions of variation in prior studies in relation to persistence.

Another possible limitation of this study involves the lack of comprehensive measures of social and academic integration in the NPSAS:87 database. However, the NPSAS:87 database provides a rich set of market-based measures of financial factors. Just as mainstream "integrationist" studies of persistence (Pascarella & Terenzini, 1991) have never included any adequate measures of market-based financial factors, "financial-impact" studies of persistence, such as the present study, have used only limited measures of social and academic integration (St. John, Paulsen & Starkey, 1996). However, the existence of omitted relevant variable bias in estimates of the effects of various factors on persistence requires that an excluded variable be correlated with both the dependent variable (persistence) and one or more included independent variables. There is no evidence to date that comprehensive integration measures are correlated with market-based measures of financial factors. Therefore, there is no empirical basis for arguing that there is omitted relevant variable in either intregrationist models which exclude adequate financial variables or in financial-impact models which exclude adequate integration measures. Clearly, this is a matter to be further investigated if and when researchers are able to examine the relations among these two sets of measures in a more completely-specified persistence model than any developed to date.

It is important to note that the NPSAS:87 database is over ten years old. Yet, the shift in policy toward higher tuition, lower grants and more loan aid began around 1980, substantially before 1986-87, and this shift has continued in the 1990s. The government grant aid has been on a downward trend since the early 1980s (Gladieux, 1998; St. John & Asker, forthcoming). The NPSAS:87 survey is timely in that it is situated around the middle of the period --1980 to the present-- of policy changes and continues to reflect the consistent pattern of such changes. Tuition and loans have increased substantially in the past ten years, so that some of the problems identified in other studies may have become even more serious today.

Organization of the Study

Chapter Two will present a thorough review of the literature and a presentation of the financial nexus model. The emphases in the review of literature will include an examination of the community college, financial aid and costs, college-choice, influence of costs and cost subsidies on persistence, and the financial nexus between college choice and persistence, along with all related models under investigation.

The quantitative research methodology will be described in Chapter Three. The research design and model will be explained in detail, focusing on the National Post-secondary Student Aid Study of 1987 (NPSAS:87). The sample data for this study were selected and retrieved from this national data base. The statistical method of logistic regression will also be presented. Finally, a discussion of the financial nexus between college choice and persistence at community colleges will be presented.

Chapter Four will present the findings of the logistic regression analysis and the theoretical interpretations of the findings.

Chapter Five will present a summary of findings, and implications and recommendations for advancement of theory, for policy and for future research.

CHAPTER TWO

LITERATURE REVIEW AND FRAMING THE STUDY

Introduction

This study will examine the financial nexus between college choice and persistence among community college students. The period since 1980 was noted for high tuition and low aid, as a result of a decrease in state financial support for public colleges and universities, which led to high tuition (Hossler, Schmit & Vesper, 1999). There was also a shift in emphasis in financial aid from grants to loans during that period (Hearn, 1993). This resulted in students and their families increasingly burdened with the responsibility of paying for the rising levels of tuition (Breneman & Finney, 1997; Mumper, 1996; Paulsen, 1998). How have these changes in college costs influenced the opportunity to attend college, choice of college to attend, and the attainment of postsecondary education from a community college? These questions play a pivotal role in framing this study. This chapter will cover this research topic by reviewing the literature and presenting a conceptual model for the examination of the financial nexus between college choice and persistence among community college students.

The literature review will include the community college history with a special focus on access to postsecondary education; information to help in understanding the history of financial aid policies in the last fifty years; college choice and student persistence at four-year and two-year colleges; and the financial nexus between college choice and persistence, which will be used as a foundation for framing the model for this study.

History of the Community College

Community college is defined "as any institution accredited to award the Associate in Arts or the Associate in Science as its highest degree" (Cohen & Brawer, 1996, p. 5). This definition includes comprehensive two-year colleges as well as many of the technical institutions, both private and public. This definition further, eliminates many publicly supported vocational schools and adult education centers and most of the proprietary business and trade colleges that are accredited by the National Association of Trade and Technical Schools, but not by the regional accrediting associations (Cohen & Brawer, 1996).

The community college is an American concept, it has been designated "democracy's college" (Cohen & Brawer, 1987, p. 2). The most attractive characteristic of the community college is its accessibility to a broad range of the postsecondary population of Americans, with a mission of providing a wide diversity of services to any student that desires a postsecondary education. Over the years, it has reached out to attract people who could not afford postsecondary tuition, at other colleges and universities, people who did not have the time to attend college on a full-time basis, whose ethnic background had constrained them from participation, who had inadequate preparation in the lower schools, whose educational progress had been interrupted by some temporary condition, who had become obsolete in their jobs or had never been trained to work at any job, who needed a connection to obtain a job; who were in prisons, had physical disabilities, or otherwise unable to attend classes on a campus, or who were faced with a need to fill increased leisure time meaningfully (Cohen & Brawer, 1996). Community colleges continue to serve as the college-with something for everyone, as seen in the growth of their vocational, technical, remedial and non-credit enrichment programs.

The community college has experienced phenomenal growth in the past two decades and is expected to play a major role in postsecondary education in the next millennium. Several social forces led to its rise, and a major force arose from the needs of workers trained to operate the nation's expanding industries, the lengthened period of adolescence that mandated custodial care of the young for a longer time, and the drive for social equality, which supposedly would be enhanced if more people had access to higher education. Additionally, increases in enrollment also resulted from general population expansion, older student participation, financial aid, part-time attendance, the re-classification of institutions, the redefinition of students and courses, high attendance by low-ability, women, and minority students. Community colleges also recruited students aggressively to an institution that has tried to offer something for everyone in the community --that is, the community college has viewed everyone as potential students (Cohen & Brawer, 1996).

At the beginning of this century, there were only eight two-year colleges, all private, enrolling a total of 300 students (Gleazer, 1961). By 1975, the number increased to 1100, the majority of which were public and had an enrollment of over 2.5 million students. Ten years later, there was an increase in the number of two-year colleges from 1100 to 1,350, enrolling 4.5 million students or 44 percent of all first-time college freshmen, constituting 40 percent of all institutions of higher education (Adelman, 1992). The rate of growth is expected to continue among two-year institutions despite the fact that total college enrollments are leveling off (Cohen & Brawer, 1996).

The most impressive feature of community colleges has been its spectacular growth in student enrollment, sometimes as much as 15 percent a year. Enrollment increased from just over five hundred thousand in 1960 to more than two million by 1970, four million by 1980, and nearly six million in the 1990s. Half of the community college population are now older than twenty-four, and 45 percent of the American population aged twenty-five to thirty-four has attended college for at least one year, in large measure due to its availability.

Access and proximity of community colleges have made them very attractive. They draw three-quarters of their entering freshmen from within a fifty-mile radius, making them neighborhood institutions, with ninety-four percent of their matriculants coming from residents of the state in which the college is located and ninety-six percent commuting to the campus (Cohen & Brawer, 1995). This factor of geographic accessibility did more to open higher education to more people than any other factor. But other factors included the policy of accepting those students who had not done well in high school or in life, and offering all people a second chance to be successful in something in the arena of postsecondary education.

The origin of the two-year college movement can be traced to William Rainey Harper, president of the University of Chicago who initiated the junior college idea at the turn of the twentieth century (Frye, 1992). He proposed and implemented the internal division of the university into two components in 1902. This would become known as the "Junior College" and the "Senior College". The University of Chicago was the first college to award an Associate degree upon completion of the "Junior College". It is important to note that Harpers' aim "had less to do with spreading collegiate education than promoting the emergent university as a bastion of the select" (Frye, 1992, p. 5).

The junior college was created to provide collegiate education to communities far removed from traditional institutions of higher education. In 1911, C.L. McLane founded the second junior college in Fresno, California, a state with only two universities at that time, with the belief that educational expansion would be an advantage to the state and to individuals (Frye, 1992). Since its founding, the United States has been more dedicated to the belief that all individuals should have the opportunity to rise to their greatest potential (Cohen & Brawer, 1996, p. 10).

At the beginning, junior colleges lacked a clear-cut role in the American educational process. However, its original mission, during the first two years, was that of a baccalaureate institution that expanded its educational programs and opportunities to a broader audience. Social and economic changes associated with industrialization and urbanization further confounded its "place" in higher education. "Industrial and commercial growth and the consequent need for training and education dominated the thinking of many 20th century educators (Frye, 1992, p. 16).

The leadership of the junior colleges wanted to tap into the void in training and vocational education, and this occupied a central focus of junior college education during this period.

Differences over ideology and mission remained central to the evolution of the two-year college. There was dissension among the leadership with regard to the shift toward vocationalism, because many believed that the respectability of the two-year institution as an equal member of the higher education community had been called into question during this era. The American Association of Junior Colleges (AAJC) expressed a mixed reaction to the increasing vocationalism of its member institutions. There was a dual objective during the early development of the junior colleges. One, that of serving both the college general education and practical needs of its local communities as a physical extension of high school, and two, that of becoming extensions of universities (Reichard, 1994).

The open-door policy during the 1950s and early 1960s of community colleges emerged quickly and became a major force in American higher education. The changing economic needs and the social consciousness of these times fueled the expansion of community college movement and also changed societal demands for increased participation in higher learning (O'Bannion, 1989). In Higher Education for Democracy,(1947) President Truman's Commission on Higher Education recommended the development and expansion of community colleges. The commission recommended that "the community college emphasize programs of terminal education" (Levine, 1978, p. 621). This recommendation was based on the graduation of two-year students gaining more from semi-professional training in light of society's changing occupational requirements (Levine, 1978). Industrial needs demanded varieties of skills, including vocational and technical, resulting in further expansion of occupational programs of community colleges for students seeking direct entry into the job market.

A lot of remedial programs were initiated for students that were unable to read, course offerings were available, and convenient to the needs of students, "day or night" (Cohen & Brawer, 1987).

Past academic sins were forgiven
as the college accepted students

> who had done poorly in high school or in prior college studies....Adults seeking personal-interest activities, avocational pursuits, or occupational up-grading where welcomed. It became the college for everyone (Cohen & Brawer, 1987, p. 2).

During this period, the universities were unresponsive to the needs of minority and other non-traditional college students. However, the community colleges provided access and opportunity to minority student populations. The university was founded on the tradition of literacy, and few could adjust to a generation for whom the major source of information was non-print media" (Cohen & Brawer, 1987, p. 2). Community colleges embraced these diverse populations, and re-invented itself to meet their needs. The community college environment protected the older four-year colleges and universities from many pressures of vocationalism and job training, from the dilemma of admission for the less-academically qualified, and from the vast increases in financial aid for poor and minority students (Dziech & Vilter, 1992).

During the 1970s through the 1980s, the primary focus of many two-year colleges was vocational education. Before, the 1970s, about one-third of two-year college students were enrolled in vocational programs, in 1975, the number had increased to fifty percent, and the proportion of students in vocational programs increased to more than two-thirds in 1980 (Karabel, 1986). This change was a result of the changing needs in the workplace and also a result of the declining market position of college graduates, by-products of a huge college enrollment in the 1960s.

Community colleges were also attracting the non-traditional student. The enrollment of the non-traditional students attending post-secondary education increased from 37,991 in 1965 to 377,660 in 1966 (Shaw, 1969). Many junior and community colleges provided programs in adult basic education and vocational education as well as more "traditional" curricula (Knowles, 1972). The reinforcement of this growth was provided by the Adult Education Act of 1966, it's amendments, and by the Continuing Education Training Act (CETA), 1973. This extended greater federal recognition and support to career and vocational education, community colleges, and trade schools as well as to students in part-time programs, breaking the stereotype that education beyond high school meant full-time attendance in a four-year academic program leading to a baccalaureate degree (Gladieux, 1995).

The growth in the number of two-year post-secondary institutions was not only a result of federal legislation and funding, but also a response to the needs of the non-traditional segment of the American population. The non-traditional students--many of whom attended part-time--have greatly influenced the growth, and the structure of the two-year institutions, particularly the current need-based aid system, which has transformed the image and ideology of American higher education (Kramer, 1991). Their participation created flexibility in program offerings, which led to an elective system for course offerings, making it possible for part-time students to follow curriculum guidelines and policies at their own pace.

Another major impact of the increased enrollment of community colleges was the entry of women into higher education. As a result, the predicted steep decline in enrollment of 1970, never reached predicted lows. In 1969, there were four million men and 2.9 million women enrolled in the undergraduate program at institutions of higher education, and by 1977, enrollment of women was nearly 4.8 million. "Women have become an increasingly larger part of the work force, particularly over the past three decades" (Pascarella & Terenzini, 1991, p. 523). This also led to increases in the enrollment of non-traditional students and students whose attendance was most likely to be on a part-time basis. In the 1990s, women have outnumbered men, 6.5 million to 5.3 million (National Center for Education Statistics, 1992, p. 185). Women constituted the majority of undergraduate enrollment, however, when all fields of study were considered, only 36.3 percent of doctorate degrees were awarded to women (National Center for Education Statistics, 1992, p. 295). Clearly this indicates a significant gender difference in the undergraduate environment of higher education.

Financial aid policies have been inattentive and the availability of financial aid inadequate, to meet the needs of these fastest-growing groups attending community colleges in the 20th century (Hartle, 1991; Kramer, 1991). Colleges and universities were overcome with the necessity of non-traditional vocationalism and found it fruitful to offer curriculum in many new areas. They attracted a great number of part-time students, particularly those that were combining work and study by making it easy for them to attend by creating off-campus centers, senior citizens' programs and weekend colleges. They have also taken on numerous instructional programs formerly offered by public and private agencies, including police academies, hospitals, banks, and religious centers resulting in continual growth in enrollment.

About half of today's new college freshman enter two-year institutions instead of a traditional four-year public or private college or university (Means, 1993). The influx of the two-year, "non-traditional" students, has led to different enrollment patterns, of students attending on a part-time basis, stopping-out, transferring, or leaving and coming back years later. They constitute a very diverse group with diverse needs that do not seem to fit any single pattern (Morris & Losak, 1986).

Community colleges do not follow the tradition of higher education as it was developed from the colonial colleges through the universities. They have enrolled one-half of all students beginning postsecondary education since

1989-1990 (National Center for Education Statistics, 1994). Of the many people who delay post-secondary education until the age of thirty or older, 68 percent began in a community college. These colleges are important especially to the educational process of people of lower academic ability, lower income and other characteristics that had limited their opportunity for other post-secondary enrollment alternatives.

However, they are limited in what they offer students. They do not provide students new value structures, further the frontiers of knowledge through scholarship and research training, when compared with residential liberal arts colleges, or the traditional universities. They do not follow their own traditions, frequently changing, looking for new programs and students, never afraid to try new approaches in an effort to keep up with the economic demands of the American labor force (Cohen & Brawer, 1996). Offering something for everyone, in familial places, they are real neighborhood colleges. "For most students in two-year institutions, the choice is not between the community and a senior-residential institution; it is between the community college and nothing" (Cohen & Brawer, 1996, p.

55).

Evolution of the Federal role in Postsecondary Student Aid

Over the past decades, there has been growth and changes in the mix of student aid dollars, from federal as well as state and institutional sources. Therefore, it is important to understand the history of government policies aimed at helping students and families pay for postsecondary education. In purchasing power, the total amount of available aid to students has grown more than fifteen-fold since the early 1960s, largely because of an expanding federal investment (Frase, 1995). Institutions supplied almost half of all aid in the early 1960s, but today they provide less than one-fifth. The federal government currently generates over thirty-five billion dollars annually in student assistance, or three-fourths of the total, the bulk in the form of federally-sponsored loans to students and their parents (Gladieux, 1995).

Federal Policy in Retrospect

Federal financial aid was designed to provide assistance to students and parents for the finance of higher education, through the Title IV programs. The concept was that of providing equal access to higher education without regard to financial need. This was the core of the convictions that spurred the growth of federal, state, and institutional student financial assistance programs in the 1960s (Linsley, 1997). To fully understand the financial nexus between college choice and persistence at community colleges, it is important to understand the financial aid history, development and policy issues within the last fifty years (Voorhees, 1997).

College opportunities in the United States have been democratized, and can be traced through two centuries, from the land-grant college movement and the establishment of state universities in the 19th century to The Servicemen's Readjustment Act (GI Bill), establishment of community college systems, and explosion of enrollment following World War II. Major phases in the growth of higher education have extended access to new groups in society (Gladieux, 1995; Mumper, 1996).

During the past decades in higher education, equal opportunity has become a centerpiece of public policy, resulting in the growth of need-based student assistance. Today, the federal government is still the largest sponsor of such aid. However, the establishment of the federal commitment did not come easily (Hearn, 1993; Gladieux, 1995).

The GI Bill was enacted in 1944 by Congress as a reward to veterans who served their country in wartime, to enable them to catch up with their peers whose lives had not been interrupted by military service. The benefits of the GI Bill were extended in the 1940s and 1950s to include higher education opportunities to thousands of men and women that ordinarily may never have gone to college (Mumper, 1996).

The Soviet launch of Sputnik in 1958 created an opportunity for Congress to justify a limited form of student assistance in the name of national security. The National Defense Education Act of 1958 provided low-interest loans for college students, with debt cancellation for those who became teachers after graduation. They also established graduate fellowships to encourage students in the sciences, mathematics, engineering, and other strategic fields. This does not include outright scholarships or need-based grants for undergraduate study (Gladieux, 1995; Mumper, 1996).

Opportunity for Aid Expanded

The Kennedy legacy of 1965, the civil rights movements, and the Johnson Administration's War on Poverty converged in the mid-1960s to break new ground. The broadest sweep of social legislation since the New Deal, presided over by the 89th Congress, produced breakthroughs in civil rights with large-scale aid to education, including the Higher Education Act (HEA) (Gladieux, 1995). Title IV of the HEA was the first explicit federal commitment to equalizing college opportunities for needy students. The goal was implemented through need-tested grants and through student support programs such as Upward Bound (initially part of the war on poverty legislation of 1964) and Talent Search, designed to identify and foster access for college-able students who were poor. Title IV of the law included College Work-Study (first ushered in as part of the War on Poverty) to subsidize employment of needy students, and the Guaranteed Student Loan (GSL) program to ease the cash-flow problems of middle-income college students and their families (Gladieux, 1995; Frase, 1995).

The purpose for the GSL program was a response to mounting support in Congress for a tuition tax credit for parents with children in college. Supporters of greater access for needy students were concerned that enactment of a tax credit and the resulting loss of federal revenue would hurt chances of funding new programs for low-income students under the HEA. Initially, the loan program appeared to be a far less costly way to help the middle class, since loan capital was from private sources. It was not projected to draw so heavily on the Federal Treasury, whose resource were to be focused primarily on the neediest students (Hearn, 1993; Gladieux, 1995; Mumper, 1996).

Congress re-authorized the HEA three years later with only slight modifications. A new program, Special Services for the Disadvantaged, was added to the law, in combination with Upward Bound and Talent Search, they became known as the TRIO programs.

The ballooning costs of the Vietnam conflict constrained the growth of many domestic social programs, but appropriations for student aid grew rapidly in the late 1960s. These monies eclipsed other forms of federal support for higher education, such as construction of academic facilities (Frase, 1995; Mumper, 1996).

The next re-authorization of the HEA was in 1972, and rounded out the principal programs and the basic charter of today's federal student aid system. Congress viewed student aid as a way to harness market forces for enhancing the quality of higher education and effective and efficient way to remove financial barriers for needy students, thus equalizing opportunities for higher education. Furthermore, Congress substituted the term "post-secondary education" for "higher education", broadening the range of options available to students in this 1972 legislation. The intent was to break the stereotype that education beyond high school meant full-time attendance in a four-year academic program leading to a baccalaureate degree. This HEA amendment extended greater federal recognition and support to career and vocational education, community colleges, proprietary schools and trade schools as well as students in part-time programs. It is important to note that proprietary schools over the last two decades proliferated, and uniquely captured a significant percentage of the federal student aid dollars (Frase, 1995; Mumper, 1996).

Congress further expanded the types of assistance that were available to students. The Nixon Administration had proposed Basic Educational Opportunity Grants to replace three existing federal student aid programs administered through the colleges: Educational Opportunity Grants, National Defense Student Loans, and Work-Study. Congress refused to repeal the campus-based programs, but did adopt Basic Grants (now called Pell Grants) envisioning this program as a foundation for all forms of aid and one that students would apply for directly to the federal government. Initially authorized at a maximum of $1,400, the Basic Grant was to provide a minimum level of resources to help assure access to higher education, and the campus-based programs would provide supplemental aid to help assure student choice among programs and institutions (St John & Elliott, 1994; Hearn, 1993, Frase, 1995; Mumper, 1996).

State Student Incentive Grants were also authorized in 1972. The SSIG program provided federal matching dollars to induce states to enact or expand their own need-based student grant programs. The 1972 law also established the Student Loan Marketing Association (Sallie Mae) as a publicly chartered private corporation to increase liquidity and capital availability in the GSL program (Frase, 1995).

In 1976, issues of quality control surfaced in the HEA re-authorization debate; Congress may have had difficulties with some of the educational options that had been legitimized in 1972. Instead, Congress was more concerned about getting banks to lend money for post-secondary education. The 1976 amendments provided federal incentives for states to establish loan guarantee agencies. Additionally, the amendment included students without high school degrees to become eligible for federal assistance as long as they had the "ability to benefit" from post-secondary training (Hearn, 1993).

In 1978, an off-year of the re-authorization cycle, under pressure for any type of response to the perceived middle-income squeeze in financing college costs, Congress passed the Middle Income Student Assistance Act (MISAA). In 1965, tuition tax credit proposals had built up another momentum in Congress. This was headed off by congressional Democrats and the Carter Administration developed a counterproposal to widen eligibility for Pell Grants and open subsidized guaranteed loans to any student regardless of income or financial need (Linsley, 1997).

In 1979, Congress passed a little-noticed amendment assuring banks a favorable rate of return on guaranteed student loans by tying their subsidies directly and fully to changes in Treasury bill rates. In the past, the rate had been set by a group of government officials with a cap on how much lenders could receive with the economy moving into a period of double-digit inflation and interest rates, student loan volume and associated federal costs exploded. The problem of lender participation and capital shortage in the loan program became a thing of the past (St. John, 1994; Mumper, 1996).

The pressure to expand financial aid for the middle class continued through the HEA re-authorization of 1980. Outmaneuvering the Carter Administration and the congressional budget committees, the education authorizing committees further expanded the criteria governing need-tested aid, while protecting the open-ended GSL from measures to curb eligibility, reduce subsidies, or otherwise control ballooning federal costs. This legislation expanded the GSL program to include supplemental borrowing opportunities for parents of dependent undergraduate students and for students who were financially independent of their parents (Voorhees, 1997).

In 1981, Ronald Regan was elected president, and the legislative expansion of 1980 was short-lived, including domestic social programs. Several provisions of the 1980 re-authorization were repealed in the 1981 budget reconciliation, needs were reintroduced as a condition of eligibility for guaranteed loans, with a five percent origination fee. This resulted in the leveling off of the growth curve of the federal student aid during the first half of the 1980s. Grant support dropped, as well as the overall purchasing power of student aid. Loan eligibility and subsidies were trimmed, but as an entitlement that became popular with the middle class, guaranteed student loans proved the most resilient form of aid. There was growth in loan volume, however at rates slower than between 1978 and 1981 (Gladieux, 1995; Mumper, 1996; Linsley, 1997).

Congressional advocates of student aid adopted a damage control strategy in light of threats to the programs in the mid-1980s of the Reagan Administration. This resulted in a status quo re-authorization of 1986. Legislators expressed concern about the increasing reliance of students on loans, but they did not have an effective means to combat this trend as tuition at both public and private institutions spiraled well ahead of inflation, which in turn, increased the borrowing needs of students (St. John & Elliott, 1994).

From 1987 to 1990, loan volume shot up. However, there was a shift in media attention and public concern was focused on mounting student loan defaults and proprietary trade school abuse. Consequently, Congress forced a series of changes that was aimed at reducing defaults which effected other cost savings during its annual budget reconciliation process (Mbadugha, 1993).

In 1992, some members of Congress sought a balance between grant and loan support for students, boosting grant aid and reducing reliance on loans. However, the 1992 legislative policy outcome drifted in the opposite direction (St. John & Elliott, 1994). The legislation also created a new, unsubsidized loan option not restricted by financial need. Designed to make loans available to the middle-income range Americans who had been squeezed out of eligibility for the subsidized guaranteed loan, resulted again, in a ballooned student loan volume of almost ten billion dollars between the academic years of 1992-93 and 1994-95 (Mumper, 1996).

In 1993, President Clinton passed the Student Loan Reform Act, altering the way student loans are financed. This legislation expanded on the Direct Loan program of 1992 and the flexibility in how borrowers repay including an income-contingent plan that is tied to the borrower's income (Gladieux, 1995).

Student Financial Aid

The need for student aid is very much a function of the level of college enrollment, the characteristics of the students, their families and institutions they attend and college costs (Frase, 1995; St. John, 1994). Institutions of higher education experienced about eighteen percent growth in enrollment from 1985 to 1995. During the fall of 1995, more than fourteen million students (undergraduate and graduate) were estimated to be enrolled in two- and four-year institutions of higher education. This represented the highest growth level ever reported. This was a result of two main reasons: College enrollment rates (the proportion of the age group enrolled in college) for 18 to 24 year-olds increased, and also the size of age group of 35 to 44 increased due to the number of 35 to 44 year-olds aging population of the baby-boom generation (Mumper, 1996; Voorhees, 1997). This increase resulted despite the fact that there was an eight percent decline in the number of new high school graduates per year over the last ten years. Furthermore, there was also a twelve percent decline in the number of the traditional college-age population of 18 to 24 year-olds between 1985 and 1995.

The majority of these students were women, white, 24-years old or younger, attending full-time, four-year institutions. The rate of participation for female students increased by 25 percent in the last ten years in comparison to ten percent for men. This higher proportion of growth for women in higher education, reflects the fact that women are more likely than men to enroll in college in the fall immediately following high school graduation, and that the enrollment rates among those 25 and older are higher for women than men. These older students are more likely to attend two-year institutions on a part-time basis (Frase, 1995).

The baby-boom generation financing their children's college education can be a huge challenge for many of them due to high tuition. The average charges for tuition, room, and board in 1993 were about $5,800 for public institutions of higher learning (in-state students) and $15,800 at private colleges. These charges represent, respectively, fourteen percent and thirty-nine percent of median family income of families that have children under 21 years, and these percentages will be higher for families that are in the lower-income levels. Consequently, student financial aid plays a major role in assisting families to pay for postsecondary education (St. John, 1994).

As institutions plan for the new millennium, they face difficult choices regarding their financing policies, particularly their pricing strategies. Overall, government support wavered within the past 12 years (Hines, 1988), and most probably will remain uncertain in the future, due to the public attitude about taxation. The public dissatisfaction with the high sticker price of postsecondary education is growing and institutions are raising tuition charges to generate revenues for a limited amount of student grants for needy students are limited (St. John, 1990). The focus of this section is to examine the influence of aid on actual choices made by students, such as whether or not to attend (access), and which school to attend.

Student choices about college enrollment can be influenced by student aid (Leslie & Brinkman, 1988) and decisions to attend college, choices regarding which college to attend, decisions to persist, and choices about majors are influenced by student aid packages as well (Paulsen & St. John, 1997).

Additionally, prior research will be reviewed focusing on the impact of student aid on equal opportunity, considering research on equal-opportunity-access (attendance), "access tuition" and "access and affordability".

Access

The opportunity to attend college is considered to be the cornerstone of the goal of equal educational opportunity. The intent of federal student financial aid programs authorized under Title IV of the Higher Education Act (HEA) was to promote equal educational opportunity for the disadvantaged (St. John, 1990). This issue of promoting equal opportunity continued to be an important policy for the United States lawmakers. In 1972, the student financial aid programs was reauthorized around the central objective of promoting equal educational opportunities (Gladieux & Wolanin, 1975; National Commission, 1974).

In spite of the changes in federal student aid programs, serious doubts were initiated and raised about the effectiveness of financial student aid in promoting student access, in part by Hansen (1983). Doubts continued about whether the Department of Education's programs had actually promoted educational opportunity (St. John, Kirshstein &

Noell, 1991). This doubt was compounded by concerns about declining minority student participation (Chaikind, 1987; Mingle, 1987; Pelavin & Kane, 1988; Wilson, 1986). Prior research, from econometric studies that controlled for appropriate background factors, found consistently that student aid had a positive influence on student decisions to attend college (Jensen, 1983; Leslie & Brinkman, 1988, St. John, Byce, & Norris, 1988; Jackson, 1988; St. John & Noell, 1989, St. John 1990a, 1990b; Andrieu, 1991).

The main issue stems from whether the decline in minority student enrollment was associated with changes in federal student aid policy (Wilson 1986, Linsley, 1997), and the ambiguities about minority student attendance and how public policies can be manipulated to improve postsecondary or college attendance of disadvantaged or minority students as a whole.

Minority Student Access

Minority students are under-represented in higher education (Cohen & Brawer, 1996). Many reasons have been provided for poor access, including changes in financial aid programs, a sense of alienation among minority students in a college environment that is predominantly driven by white middle-class values, with little or nothing in the curriculum that addresses minority issues or cultures. The issue of alienation among minority students will be discussed further in the section on persistence literature. This issue has critical implications for community colleges because, traditionally, community colleges emerged with the ideals of equal access for all citizens, and promoting upward mobility for people in the lower economic strata.

Equal educational opportunity has been a national policy since the late 1960s, yet progress toward that reality has remained slow and uneven. The gap between the amount of schooling for African Americans (the largest of the racial and ethnic minority groups in America) and that of white Americans has continued to widen since 1975, the time at which black student enrollment rates peaked and began to fall. During the years 1960 to 1988, college enrollment rates among black students rose from 18 percent to 26 percent, while white enrollment rates increased from 24 to 34 percent (Blackwell, 1994).

Doubts about the effectiveness of the federal student aid programs continue to plague policy makers because the majority of black college students come from low-income homes, where three-fifths of these students hail from families whose annual incomes are less than $18,000 and 40 percent from families whose incomes are less than $12,000 annually (Mbadugha, 1993). The majority of black college students require financial aid in order to decide to attend, and make subsequent enrollment decisions. This is because increases in college tuition have outpaced inflation since 1980. During the same time period, there were increases in the median family income and savings, average amounts of Pell grants, average amounts of guaranteed (Stafford subsidized) student loans, and average state grants, but none of these growing resources was able to keep up with increases in tuition (College Board, 1996; Lewis, 1989; Mumper, 1996; Paulsen, 1998). However, enrollment rates of high school graduates from diverse races--white, black, and Hispanic--and from diverse income groups of low, middle and high, increased between the early 1980s and early 1990s (U.S. Department of Education, 1997), in spite of the apparent reductions in the affordability of college for these groups. Thus, changes in federal policies toward educational aid have continued to result in an under-representation of minorities on most college campuses today.

Shift in Policy

There was a shift in federal policy regarding financial student aid between 1975 and 1986. There was a decline in outright grants as a percentage of total financial aid from 80 percent to 46 percent of financial aid, while loans increased from 17 percent to 50 percent of financial aid packages (Frase, 1996). This resulted in a decrease in access for low-income students whom are less likely to apply for loans because of their cultural habitus.

African Americans are less likely than whites to seek educational loans for two reasons. First, they are more economically vulnerable than whites as a group, more often poor, more likely to face unemployment, and have fewer economic assets such as stocks, bonds and real estate (Wilson, 1986; Paulsen & St. John, in press). Second, because of a history of racism in our society, they are least inclined than whites to take a chance and seek a government loan (Linsley, 1997; Wilson, 1986).

Early student demand studies, conducted before the dominant federal role in student aid developed, consistently found that students were price responsive to tuition increases, and that the probability that students would enroll decreased with increases in the amount of tuition institutions charge (Jackson & Weathersby, 1975; McPherson, 1978; Leslie & Brinkman, 1988). However, the initial National Longitudinal Study of the High School class of 1972 (NLS-72) (Jackson, 1978; Manski & Wise, 1983) using appropriate controls, consistently found that student aid had a positive impact on attendance (Leslie & Brinkman, 1988; St. John, Byce, & Norris, 1988).

Jackson's (1989) study of the High School and Beyond Senior Cohort found that student aid had a positive influence on enrollment by college applicants in 1972 and 1980. St. John and Noell's (1989) study on the influence of different types of student aid packages on enrollment decisions of students in the high school classes of 1972, 1980 and 1982, found that all types of aid packages were positively associated with attendance decision, and that packages with loans were less consistently significant for minority applicants than for white applicants. Therefore, financial student aid is positively associated with educational access and opportunity.

Access vs Affordability

Increases in college tuition have consistently outpaced inflation since 1980; albeit the amounts of increase were somewhat smaller in the 1990s when compared to the 1980s. Since 1980, increases in median family income and savings, average amounts of Pell grants, average amounts of guaranteed (Stafford subsidized) student loans, and average state grants were all unable to keep pace with increases in tuition (College Board, 1996; Mumper, 1996; Lewis, 1989; Paulsen, 1998).

The changing affordability of college education was manifested in changes in the distribution of enrollment rates of different income groups at different types of institutions between 1980 and 1994 (McPherson & Schapiro, 1998). One of the significant results of these changes is the enrollment redistribution patterns at public two-year colleges. With the lower-income students over-represented at the most affordable type of institution; community colleges, enrollment rates of lower-income status at these two-year colleges increased further, from 45.9 percent to 47.3 percent. However, there was a dramatic flight of more affluent students from community colleges, "from 38.9 percent to 33.7 percent for middle-income students, 27.6 percent to 22.1 percent for upper-middle-income students and from 14.5 percent to 8.6 percent for the richest students" (McPherson & Schapiro, 1997, p. 46).

Research revealed that students attending community colleges were more sensitive to changes in tuition and financial aid than others attending four-year colleges (Heller, 1997; Paulsen, 1998). This account may be due to the growing concentration of the lowest-income students at community colleges. As tuition rates increased, it became less affordable for lower-income students, even with financial aid. Hence, they were further squeezed out of the traditional mainstream of education.

Kane (1995) found a much larger negative impact on enrollment due to increases in tuition at public two-year colleges than at public four-year colleges. Consequently, when it comes to access to higher education, the "marginal price-determining whether or not people attend college at all-is public two-year-college tuition and not four-year tuition" (p. 10). Another study, similarly, called the public two-year college tuition as "access tuition" and used it as a key indicator of differences in the accessibility of higher education in state-to-state comparisons (Halstead, 1996). This is consistent with the community college literature, because community colleges serve as neighborhood colleges that have something for everyone at a lower cost.

Research has also shown that community college students are highly sensitive to tuition and aid (Paulsen, 1998). However, this is very problematic, due to continued increases in tuition amounts and less grant aid for lower-income students that may consider community college as a last chance of obtaining a sub-baccalaureate degree. Between 1980 and 1993, real (inflation-adjusted) tuition at public two-year colleges increased by 61 percent (Paulsen, 1998; Mumper, 1996). This further squeezed out students from lower-income and under-represented groups because the community college is fundamentally viewed as a "point of access college, continued increase in tuition at these colleges may threaten the equity of access to American higher education at its most common--and perhaps sometimes its most fragile--point of entry" (Paulsen 1998, p. 485).

Equity of access and affordability is still in question, since federal financial aid programs have continued the shift from grants to loans. For example, between 1993 and 1994, federal family education loans increased by over 38% after inflation, while grants decreased by 11% (College Board, 1996).

Student Choice

Student choice -- as both a process and as a construct-- plays a critical role in the economics, finance, and management of higher education. Because participation in higher education is voluntary rather than mandatory, students' decisions to attend and persist in college, as well as their academic decisions about major programs, are not in the direct control of government or institutional planners. These student choices can be influenced by factors external to colleges and universities, such as economic conditions, as well as management decisions made within institutions (St. John, 1991). Thus, an understanding of student-choice research is integral to enrollment management.

In a modern society such as America, families believe that almost everyone should have some type of postsecondary education. However, many high school graduates do not continue their education after high school. Some of them make plans to attend through most of their high school years, but often times for a variety of reasons matriculation is delayed or enrollment never happens

(Abrahamson, & Hossler, 1990; Hossler et al., 1999). Many students who do not go to college could not remember any time they had not planned to go to college, others made last minute decisions, as late as a week prior to the beginning of the academic year to go, while others that had decided to attend found out late that they had not taken appropriate courses (Hossler et al., 1999).

Those students who have always had plans to continue their formal education beyond high school are faced with very difficult decisions about choice of college to attend and how to finance it. However, college students make many decisions and choices during their academic careers. Decisions are made at different levels, before, during and semester after semester enrollment (Hossler et al., 1999). First, they choose whether to go to college and later, which college to attend, whether to attend full-time or part-time, what major or minor fields of study to pursue, what courses to take, and the professors with whom they study. Making a choice about going to college is one of the first critical noncompulsory decisions American adolescents are expected to make. It represents a major point of departure from the final stages of childhood to the first steps of adulthood

(Hossler, et al., 1999). These decisions have lifetime consequences because it has a lasting impact on careers, livelihoods, and lifestyles of individual citizens and society as a whole. Subsequently, and repeatedly, students also choose whether to drop out, stop out, transfer, or continue their current studies. These choices made and other similar choice situations are viewed as patterns of decision-making behavior (Paulsen, & St. John, 1997; Hossler et al., 1999).

Two different lines of research have been developed to examine college choice decisions on the one hand (Hossler, Braxton & Coopersmith, 1989; Paulsen, 1990) and persistence decisions on the other (Bean, 1990B; Cabrera, Castaneda, Nora, & Hengstler, 1992; Pascarella & Terenzini, 1991; Tinto, 1993). First, theories of "college choice" provide explanations regarding the determinants of whether a potential student choose to go to college and which college he or she attends (Jackson, 1978; Manski & Wise, 1983; Zemsky & Oedel, 1983). Second, theories of "persistence" offer explanations regarding determinants of whether an enrolled student chooses to re-enroll or continue his or her studies during the next semester or year (Astin, 1975; Bean, 1980; Pascarella & Terenzini, 1980; Tinto, 1993). This clear line of demarcation between choice and persistence research occurs because they are applied to distinct enrollment management functions like marketing and recruitment research (Braxton, 1990; Litten, Sullivan, & Brodigan, 1983; Paulsen, 1990; Paulsen & St. John, 1997).

This section will only review college choice literature, focusing briefly on theories of student choice in sociology and economics as well as the status attainment literature and how shifts in student aid policy influences student choice of school. Further, this section will also discuss how financial interactions affect the choice processes at community colleges. Persistence literature will be reviewed in the next section.

Prior research (Jensen, 1983; Leslie & Brinkman, 1988; St. John, Byce, & Norris, 1988) on student choice consistently found that student aid was effective in promoting student choice of college (Manski & Wise, 1983). Jackson (1977) concluded in his analysis of NLS-72, that student aid offered had a significant influence on the choice among the schools students applied to. The amount of aid offered (all types) and the amount of tuition charged influenced student choices; Tierney (1982a & b) examined how student aid and tuition charges influence the choices students make between public and private institutions by students that applied to both, and found that both tuition and financial aid had significant influences on students' choice.

Grubb (1990) examined the causes of enrollment in different types of institutions with the NLS-72, and concluded that higher tuition charges in community colleges tended to drive more individuals, especially women, into private schools, and that higher tuition charges in public four-year colleges tended to increase enrollment of both men and women in private research universities, and also increased enrollment of men at Liberal Arts I Colleges. For example, the California community colleges had a decrease of 9% in enrollment in the fall 1993, which was attributed in part to tuition increases (Freedberg, 1993). St. John and Starkey (1995) reported that adult students are more price sensitive than traditional-age students, at least in four-year colleges. Furthermore, Hippensteel, St. John, and Starkey (1996) reported that student aid subsidies were insufficient to mitigate the negative effects of tuition on enrollment in two-year colleges.

The question of how prices influence persistence with adults at community colleges has significant policy implications. The goal of many financial aid programs for needy students is to reduce the cost of postsecondary education in order to promote choice and access. As access and choice are enhanced, there is an increasing interest in persistence in terms of student aid policy (Carroll, 1987; Jensen, 1983; Voorhees, 1985).

Educational Attainment Patterns

Opportunity structures are "the pathways to success in American culture," (Marshall 1994; McDonough, 1997). For high school students who choose to go to college, their academic achievement, social class background, and high school experience will shape how they perceive their higher education opportunities. No student sees the opportunity of going to college in its entirety, but instead, only imagines schools that he or she deems "right" or "appropriate," or schools where he or she will feel comfortable (McDonough, 1997). In this section, I will review patterns in college access and how it affects student choice.

In all achievement levels, the lowest socioeconomic

(SES) student groups are less likely to apply or attend college than the students from the highest socioeconomic group. It is important to note that among the highest-ability students, 60 percent of the lowest SES students attend college, while there is 86 percent attendance from the highest SES group students (Gardner 1997, McDonough, 1997). African American students and poor students in general, are less likely to begin or finish college (Levine & Nidiffer, 1995) and more likely to attend low-prestige colleges or those with the highest dropout rates (Hearn, 1984).

There are salient differences between two-year and four-year colleges. Prestigious and non-prestigious universities, private and public institutions generate important sources of inequality in adult life. "Where one attends college influences one’s eventual educational attainment" (McDonough, 1997, p. 3). Much research has shown that the college one attends affect one’s chances of completing a baccalaureate degree significantly, and that the proportions of students who persist until graduation differs very much across institutions, even after controlling for academic ability (McDonough, 1997). Elite institutions have high graduation rates of 85 to 95 percent, while public four-year institutions have far lower rates of about 45 percent. Community colleges that enroll over half of this country's first-time freshmen, have transfer rates of about 20 percent and baccalaureate degree completion rates for those students who started at community colleges are lower than that of students who began their postsecondary education at a four-year college (McDonough, 1997; Adelman, 1988).

Furthermore, it is evident from research that college attendance patterns are as much an issue of self-selection processes as they are of college admissions decisions. Students' decisions are also constrained by or interact with the availability of appropriate institutions, with academic ability, and with family resources (Jackson, 1978). Living in a good neighborhood, attending a good school, having a prosperous family, or being more able academically, all increases the likelihood of a student attending college as well as parental and peer pressure to attend. However, lower SES students with strong desires to attend are attracted by financial aid offerings of colleges because of the reduction in net price (Jackson, 1978).

College Choice

The literature on college choice is extensive and examines students choices from the time of the earliest foundation of college aspirations to the time of matriculation at a particular college (Hossler, Braxton & Coopersmith, 1989; Paulsen, 1990). Students go through a variety of stages in their choice process, with each stage leading a student to eventually and gradually narrow his/her options to one single institution (Hossler & Gallagher, 1987; Jackson, 1982).

Research has consistently viewed college-choice as a three-stage process (Hossler & Gallagher, 1987; Jackson, 1982; Paulsen, 1990). Research findings based on the use of this three-stage model are utilized by enrollment managers in student marketing and recruitment activities as a guide (Paulsen, 1990; Hossler et al., 1999). This review will examine the ways the determinants of educational attainment in sociological models interact with the determinants of human capital investment decisions in economic models to influence choice behavior within each stage of the process (St. John, Paulsen, Starkey, 1996).

Economists view college choice as a form of investment decision making or net-benefit maximizing behavior that is rational for students "who can expect in the long run to get back more than they must spend" (Jackson, 1978, p. 549), while sociologists view college choice as part of a broader status-attainment process (Jackson, 1978).

Stage one of college choice deals with the formation of college aspirations, when students develop the predisposition or intention to continue their education beyond high school. In the second stage or search phase, students begin to search for general information about colleges, develop a choice set, and begin to consider several specific colleges to attend. This phase ends when students make the decision to apply to a particular set of institutions. After students have completed the application process and have been admitted to their chosen set of colleges, then they enter a final stage three, the choice phase, when the student narrows the choice set down to a single college and chooses to attend that college (Hossler & Gallagha, 1987; McDonough, 1997; Paulsen, 1990).

Researchers have consistently found a number of factors in the search and choice phase influential: parents, size of college , location, academic program, reputation, prestige, selectivity, alumni; the student's peers, friends and guidance counselors and availability of financial aid and the total cost of tuition and expenses (Hossler, Schmit & Vesper, 1999; Paulsen, 1990; St. John, 1990; Zemsky & Oedel, 1983).

Economists base their model of college choice on human capital theory (Becker, 1993). The human capital theorists see college-going behavior as an investment in the acquisition of human capital, whereby students expect in the long run to get back more than they must spend. Individuals and society are assumed to base their investment decisions on an economic return which compares the present discounted value of benefits with present discounted value of costs associated with expenditures on college education (Paulsen, 1998). Studies based on economic models of college-going behavior reveal that when students select one college to attend from a set of colleges, or non-college alternatives, it is assumed that the net benefit from this option must be greater than that perceived from alternatives. However, students only reveal their true preference through the act of choice, therefore, the net benefit can only be inferred. Students engaged in making choices about their postsecondary activities are assumed to maximize the expected net benefits (both current and future) associated with their investment in human capital. Research has consistently demonstrated that all else being equal, higher levels of costs, due to less aid or greater tuition and other costs, tend to reduce the likelihood of such investments and therefore, reduce the likelihood of enrollment (W.E. Becker, 1990; Manski & Wise, 1983; Paulsen, 1998).

Status Attainment

Academic achievement remains one of the most important determinants, for all students, of whether and where they go to college, as well as personal, social and financial outcomes which influence the development and distribution of status in society (Alexander & Eckland, 1975; Sewell & Hauser, 1976; Hearn, 1991). Sociologists consider aspirations or predispositions about educational attainment to be an important component of the status attainment process. Hence, systematic relationships exist within groupings by achievement, between income and college selectivity (Hearn, 1991). Irrespective of academic factors, upper-income students are most likely to enter America's elite colleges (Hearn, 1987). Black women and low socioeconomic (SES) students are especially likely to attend less-selective institutions, even if they have high ability and achievements (Hearn, 1984 & 1990).

Long-standing goals of going to college can be a resource and increase the likelihood of attending by 21 percent particularly if the intent to go to college was developed prior to tenth grade (Alexander & Cook, 1979). However, educational-students' expectations play a major role in college placement and are sometimes the single strongest predictor of college attendance (Hearn, 1984). Furthermore, students' and parents' perceptions, attitudes, and knowledge regarding college attendance take on different shapes for different social classes and races as early as the tenth grade, and produce differences in families' college panning. For example, high socioeconomic (SES) students tend to take more college preparatory courses than students from low SES groups (McDonough, 1997; Hearn, 1984). Additionally, there are major differences in the application practices of students from different socioeconomic strata. First- generation students planning to go to college tend to opt for the most competitive Ivy League institutions or less expensive state schools, while middle and upper income students complete twenty or more applications, applying everywhere, even though a minimum fee of forty dollars is required for application (McDonough, 1994).

Race appears to be more influential than gender in affecting the process of college entry if achievement is held constant. For example, survey data suggests that Asian Americans have a strong orientation to selective colleges and are twice as likely to apply to the best schools as white students (Karen, 1988). Karen (1988) contends that African Americans and Hispanics, as a group, are less likely to try to get into highly selective colleges because of their subjective assessments of the impact of their lower grades, test scores, and levels of participation in extracurricular activities.

The most stubborn barriers to parity in entrance to college are in social class background rather than race, ethnicity, or gender (Hearn, 1984 & 1991). Social class exerts twice as much effect on the selectivity of a student's college choice as does ethnicity or gender (Karen, 1988). However, working class women are more disadvantaged in educational attainment than are their male counterparts.

The main impact of class status on educational attainment operates directly through individual choice and indirectly through the impact of scholastic aptitude on available options (Karen, 1988). Student choice is mediated in part by socioeconomic effects of parents' knowledge of what it takes to prepare for college, number of books in a home and related variables that affect the attainment of students. Furthermore, students whose parents have gone to college often get a head start on college preparation in elementary school by taking the right course (prepares these children ready and better at an early age) and maintaining good grades, and their families are more likely to obtain information about the different types of colleges and universities and the importance of making good grades. Conversely, students who are first-generation college attendees are less likely to get the necessary information, and often do not take the right courses, and struggle with the cultural conflict between their new college-oriented world and the world of their families, friends and communities. In summation, having college plans at least by the tenth grade, attending a college-focused high school, having parents who expect their children to go to college, and having assistance in negotiating an adequate financial aid package are the key determinants to college attendance and choice. It is of special importance that these factors (advantages) are typically unavailable to students and families in low SES groups.

Cultural Capital

"Cultural capital is that property that middle and upper class families transmit to their offspring which substitutes for or supplements the transmission of economic capital as a means of maintaining class status and privilege across generations" (McDonough, 1997, p. 9). In other words, upper and middle class families value college education and advanced degrees highly, and see this as a way of ensuring continuing economic security, in addition to whatever monetary or financial assets that they can pass along to their offspring. This type of knowledge is valued, yet it is not taught in schools. In addition, a student's disposition toward school is important because to maximize or conserve cultural capital, one must be willing to consent to the investments in time, effort and money that higher education requires.

The Habitus Concept

The concept of habitus refers to a deeply internalized, permanent system of outlooks, experiences, and beliefs about the social world that an individual gets from his or her immediate environment (Bourdieu, 1977). Hence, habitus is a common set of subjective perceptions held by all members of the same group or class that shapes an individual's expectations, attitudes, and aspirations. In this case, aspirations are both subjective assessments of the chance for mobility and objective probabilities. Students of different classes make educational choices by looking at the people around them and observing what is considered good or appropriate for him or herself. Hence, the appropriate choice, whatever it may be, plays an important part in the complex decision when choosing a college or its alternative.

In combination, the human capital perspectives, status attainment perspective, habitus and cultural capital perspectives provide a basis for a logical connection or linkage between student choice and persistence. From the status attainment literature perspective, to be admitted into college is the point when background and ability influence educational aspirations, and have sufficiently interacted with attributes of colleges all through the choice process phases, to the point that educational plans are now transformed into institutional and goal commitments (St. John, Paulsen & Starkey, 1996). These initial commitments can refer to attitudes, which may be modified by college experiences resulting from financial factors or by experiences with academic and social integration.

From the human capital theory perspective, to be admitted refers to the point

> at which the economic calculus (influenced by socioeconomic background and ability factors) used to evaluate tangible and intangible benefits and costs of college have culminated in an investment decision that results in an initial commitment to the institution and to the goal of persistence in college. Human capital theory predicts that the student investor will target her investment on the post-secondary option where the perceived return of benefits relative to costs is the greatest (St. John, Paulsen, & Starkey, 1996, p. 182).

Studies on rate-of-return have consistently shown that the rate-of-return on "some college" is greater than the return on high school, while the rate of return on "college completion" is greater than the return on some college (Cohn

& Brawer, 1996; Leslie & Brinkman, 1988; McPherson & Schapiro, 1991).

The admission decision, as important as it may be, is only an initial commitment based on the pre-admission expectations of benefits by the student (academic, social, financial) and costs of attendance at the college of choice (St. John, Paulsen, & Starkey, 1996). This initial commitment or admission may be "viewed as an implicit contract that is upheld when a student's expectations are met through college experiences that interact favorably with the background nd ability of the student" (St. John, Paulsen, & Starkey, 1996, p. 182). This implied contract is based on two key components: (1) the main reasons for making the investment decision about attendance and being admitted at a particular college, and (2) the assumptions that there will be no unforseen changes in cost such as a reductions in financial aid or decreases in benefits of either academic or social or both associated with continued attendance. It is important to note that this contract can change when college experience interacts with the characteristics of the individual student. This can generate differences in the expectations held by the student at the time of admission and may also warrant a reexamination of the benefits and costs of continued attendance, which may possibly change the intent to persist. Therefore, the nexus construct may apply to a range of college choice-persistence interactions: the economic reasons (cost benefit) for choosing a college could influence the ways students subsequently respond to financial factors related to attendance, the academic or social reasons for choosing a college could influence the way students integrate academically or socially; the college location and financial reasons for choosing a college could influence college affordability; and all these sets of reasons could, in combination, constitute the elements necessary for the development of a financial impact model (Paulsen, St. John, & Starkey, 1997).

Persistence

Persistence research has long been considered a component of the equal educational opportunity goal (St. John, 1990). The Higher Education Act of 1965 established federal aid to higher education in an effort to help meet the goal of persistence in post-secondary education programs (Gladieux, 1983). Persistence research remains one of the most extensive areas of literature in higher education.

This section will review only the relevant major developments in theory, research and application toward the development of a financial-impact model, assessing the nexus between college choice and persistence among community college students.

The theories of Tinto (1975) and Bean (1982) had been the foundation for much of the earlier mainstream or traditional persistence research that had been used by other researchers (e.g., Cabrera, Castaneda, Nora, & Hengstler, 1992; Hippensteel, St. John & Starkey, 1996). These two theories examined the influence of student background, initial commitment, and social and academic integration on re-commitment and retention.

Virtually no national or institutional research has specifically been conducted on the financial nexus between college choice and persistence among community college students. So far such research has only focused on the study of students attending four-year colleges (Paulsen & St. John, 1997; Paulsen, St. John, & Starkey, 1995; St. John, Paulsen & Starkey, 1996; Paulsen & St. John, forthcoming). But a financial-impact model (as opposed to a financial nexus model) for persistence research has been used previously for the study of the persistence behavior of community college students (Hippensteel et al., 1996; St. John & Starkey, 1994). Therefore, a logical model for examining the financial nexus between college choice and persistence among community college students can be derived from the existing research literature. The theoretical framework for such a model views this community college nexus from three perspectives: (1) the economic perspective on college enrollment, persistence, and eventual attainment; (2) the sociological view of educational achievement, occupational attainment, and mobility processes; and (3) a brief review of persistence research and models. Due to limited research on community colleges, most of the variables will be grounded in research related to the undergraduate student at four-year colleges.

Economic Perspective

The economic perspective will be presented from two vantage points. First, postsecondary education as an investment in human capital, and second, the financial aspects of postsecondary education.

Human Capital. Human capital theorists of the 1960s focused on human investments, the effects of these investments on economic development as well as its effects on the individual. This provided a basis for examining individual and public decisions to invest in education (Becker, 1975). The human capital theory states that investments in human capital influence future psychic and monetary income. These investments come in different ways, differing in their "effects on earnings and consumption, in the amounts typically invested, in the size of the returns, and in the extent to which the connection between investment and return is perceived" (Becker, 1975, p. 1). For the individual, the direct costs of these "investment" decisions include tuition, fees, books, and living expenses (St. John & Masten, 1990). Postsecondary education and its federal support through Title IV financial aid is an example of investment in human capital.

Human capital theory concentrates on the degree of relative returns to investment in postsecondary education (Catsiapis, 1987; Hansen, 1987; Matila, 1982; Smith, 1986). It views the student's decision to go to college and obtain a degree in terms of the expected net present value of the educational investment. A postsecondary education is seen as an investment that is profitable, yielding higher rates of return when compared to those that have no postsecondary education. The foregone earnings spent on education are viewed as important indirect costs of investment in higher education. The monetary returns for the individuals include increased lifetime earnings from gains in educational attainment. In addition to personal returns on investing in postsecondary education, there are also returns to society, such as the return on investment in aid money, the increased tax revenues and workforce productivity attributable to the gains in educational attainment and a variety of tangible benefits to society (Bowen, 1977; Leslie & Brinkman, 1988; Paulsen, 1996a, 1996b; St. John & Masten, 1990).

The economic value of going to college and the rate of return on education varied considerably from 1956 through 1979. The 1970s was a period of slower economic growth. However, educational attainment of the labor force was on the increase. This period of economic decline generated a debate on the economics of education among economists, which resulted in a public dispute on the alleged "overinvestment" in college education based on decreases in the economic rewards for college graduates (Freeman, 1976). However, recent research on the economic value of private return to an investment in a college education's earning differential between college-educated and high-school-educated members of the workforce indicates that "the earnings for college-educated workers--across all fields and levels of experience--exceeded that for high-school graduated by 40 percent in 1963; 48 percent in 1971, 38 percent in the late 1970s, and 58 percent in 1989" (Paulsen, 1998, p. 473). The completion of an associate degree at a two-year college results in a significant increase in earnings for men and women. Even noncompleters of one-year of two-year college credit earn substantially more money, and the increase in earnings are similar to that of one year of four-year of college credit of a baccalaureate degree. Additionally, participation in postsecondary vocational education for a least six months results in a substantial and significant increases in earnings, especially for women and those in the lowest segment of the society in terms of socioeconomic status (Lewis, Hearn & Zilbert, 1991; Paulsen, 1998).

Student Demand Theory

Student demand theory is related to price, which is applicable to enrollment and persistence in postsecondary education as it relates to the income of the individual, the cost of the education, the cost of forgone alternative to college education, and individual aspirations and desires. This theory is part of the human capital demand theory of Becker (1964), which was predicated on the assumption that students will purchase more education when prices are lower and less education at a higher price, all else equal (Stafford, Lindstedt, & Lynn, 1984).

Other researchers (St. John, 1994; St. John & Elliott, 1994) had initiated the process of critically examining the tacit assumptions of the human capital theory.
This related to other examinations by Dresch (1975), who identified several problems in the tacit assumptions of the human capital model. Jackson and Weathersby (1975), Leslie and Brinkman (1988), and McPherson (1978) have all attempted to refine Becker's (1964) price response measure. However, St. John and Elliott (1994) indicated that these researchers made no conclusive claims with regard to establishing a universal price response measure that accurately predicts college enrollment.

Human capital theory postulates that changes in price of tuition or subsidies such as grants or loans, which alter the cost of college, lead students to reevaluate the returns to investment in higher education. This makes it very important to understand student responsiveness to the various costs of college, and changes in these costs, as well as their impact on the daily activities of decision makers in the educational arena. Paulsen's (1998) study indicates that students are responsive to changes in related prices and subsidies, tuition, grants, and loans, all of which have become key elements for decision makers to use in their efforts to promote access, choice, equity, and efficiency in the provision of opportunities for advanced education particularly for minority students. Since 1980, college tuition increases have consistently outpaced inflation, although in the 1990s, the amount was smaller in comparison to the 1980s. In the same time period, "increases in median family income and savings, average amounts of Pell grants, average amounts of guaranteed (Stafford subsidized) student loans, and average state grants were all unable to keep pace with increases in tuition" (Paulsen, 1998, p. 483). Amazingly, the enrollment rates of high school graduates from different races and different income groups increased in the same time period from the 1980s through the early 1990s. However, economists attribute this simultaneous increases in tuition and enrollment rates to the substantial increases in the earnings differentials between college and high school graduates during this period (McPherson & Schapiro, 1997; Paulsen, 1998).

The gap in enrollment rates of white and minority youth between eighteen and nineteen-years olds, as well as between higher- and lower-income students (lowest income when compared to the top three income quartiles) widened by twelve percent between 1980 and 1993 (Kane, 1995). Additionally, the enrollment rates of white students were about five percent higher than those of black students and about three percentage points higher than those for Hispanics. The gap has been widening from the 1980s, and by the early 1990s the gap was around twelve percent for blacks and seven or so percent for Hispanics (McPherson & Schapiro, 1998). According to recent research, "lower-income students are more sensitive than higher-income students to both increases in tuition and decreases in financial aid" (Paulsen, 1998, p. 484). Furthermore, Heller's (1997) findings indicated that black students are more sensitive than white student to changes in tuition and aid, a difference that persists after controlling for income, ability and socioeconomic backgrounds of students (Heller, 1997, cited, Paulsen, 1998). In combination with the inability of the federal and state aid programs to offset the rapid increases in tuition since 1980. This implies that more and more minority students are being squeezed out of educational opportunities, resulting in a possible reduction in equity of access to higher education (Paulsen, 1998).

Financial Aid

Research on college persistence clearly indicates that persistence is positively associated with the receipt of student aid (Astin, 1975; Jensen, 1983; Leslie & Brinkman, 1988; St. John, 1989, 1990b; St. John & Starkey, 1994; Hippensteel, St. John & Starkey, 1996). Research further indicates that the amount of aid has a negative impact on persistence (Leslie & Brinkman, 1988; St. John & Starkey, 1994; Hippensteel, St. John, Paulsen & Starkey, 1996). From the economic perspective, financial aid benefits in the form of grants and scholarships and other monetary gifts, earmarked for education, help to reduce the costs of college attendance, and increase the likelihood of persistence in higher education. One of the researchers (Stampen, 1983) pointed out that approximately two out of every three students enrolled in post-secondary institution are in need of some form of financial assistance. Therefore, financial student aid has emerged as a vital determinant of student persistence. However, the majority of early conceptual models for investigating student persistence did not examine the impact of financial student aid programs on persistence behavior (Bean, 1980; Rootman, 1972; Spady, 1971; Tinto, 1975). Recently, however, researchers have began to examine the impact of financial aid and other factors on attrition (Cabrera, Castaneda, Nora, & Hengstler, 1992; St. John, 1989; St. John, et al., 1991; St. John & Starkey, 1994; Stampen & Cabrera, 1986, 1988).

The purpose of many financial aid programs on various college and universities is to increase the likelihood of student persistence, with the goal of reducing the net cost of attendance for needy students in an effort to promote opportunity, access, equity, and choice. This study will focus on developing a financial-impact model relative to financial aid policy that could enhance access and choice for community college students (Linsley, 1997; Voorhees, 1997).

Sociological Perspective

The second major aspect of persistence is the influence of the sociological perspective on the process of persistence and on educational attainment. Since the early 1900s, sociologists have been interested in educational attainment and its effect on social and occupational mobility. However, it was only in the 1960s that educational attainment, as a determinant of an individual's place in the social hierarchy, began as a sociological research topic (Alexander & Eckland, 1975; Sewell & Hauser, 1975).

The sociological perspective is an important theoretical framework that provides a concrete understanding of college participation, student persistence and educational attainment. Integral to a number of the educational attainment models are the socioeconomic and family background variables, which includes parent's education, occupations (Blau & Duncan, 1967) and financial contribution to education, family income and academic ability (Sewell & Shah, 1967) and individual aspirations (Sewell & Hauser, 1975; Trent & Medska, 1968).

Early educational research on educational attainment used a logical model to examine the interactions among four variables--family background, educational attainment, early occupational status, and current occupational status. This model offered an explanation of the effects of family status on an individual's occupational achievement (Alexander & Eckland, 1975). However, this model included limited variables. It did not explore or include variables on academic ability or interpersonal experience information that is related to school and family. Alexander and Eckland (1975) later expanded the Blau and Duncan (1967) model on educational attainment, using a national longitudinal sample, which included variables such as academic ability and educational plans. This offered an explanation of how status and ability affected various occupations based on the level of education attained (Alexander & Eckland, 1975).

The sociological perspective on educational attainment provided a wider lense for viewing the influence of family background, parental education, family income, academic ability and aspirations on persistence. Persistence is an important factor in attainment which explains the inclusion of the socioeconomic variable in a model that was designed to explain the persistence process. This is important for this study on the examination of the financial nexus between college choice and persistence among community college students and the development of a financial impact model for this population, because it offers an important perspective on the variables used in the model, and provides a strong theoretical base for this study.

Persistence Models

In addition to economic and sociological perspectives, it is important to review existing models of educational persistence because it provides the foundation for examining the financial nexus between college choice and persistence among community college students and the development of the financial impact model. Furthermore, it broadens the theoretical base for this study.

Departure from college whether voluntary or not has been the attention of numerous studies beginning as early as 1937 (McNeely, 1937). Most of these studies have examined numerous variables considered to influence undergraduate students' withdrawal decisions from an institution. The vast majority of these studies have been institutional persistence studies of undergraduate students in the past several decades, developed out of the research by Spady (1971) and Tinto (1975).

Spady Model

Spady's (1971) persistence study marked the beginning of a body of work that developed comprehensive models for the study of undergraduate dropouts, laying the foundation for a sociological perspective. Spady's (1971) theoretical model is rooted in the Durkheimian (1951) theory of social integration which suggests that a student's success in college is influence by sociological variables such as family background and high school experience.

Spady (1971) synthesized the earlier literature on dropouts from higher education and tested a theoretical model of undergraduate dropout phenomena using the entering class at the College of the University of Chicago. He found that each student entered college with a distinguishable pattern of dispositions, interests, expectations, goals, and values shaped by family background variables and other variables such as previous high school experience. Additionally, he also found that previous academic performance was the dominant factor that influenced the attrition process of students. All these variables greatly influenced the student's ability to successfully integrate into the college environment.

Tinto Model

Tinto's (1975) model of institutional departure built upon Spady's (1971) model. Tinto, like Spady, used Emile Durkheim's theory of suicide as a basis for his model. He postulated that the process of withdrawing from college, in a general sense, is analogous to withdrawing from society (suicide), and can be studied in a similar manner. Accordingly, the Tinto (1975) model argues that the primary reason for a student to withdraw from college is due to a lack of successful integration, both socially and academically within the institution of attendance.

Major criticisms of the Tinto model were that the model was institutionally based, limiting its applicability to national data, and that it lacked variables that considered the impact of financial aid and price. Tinto argued that students departing from college regularly express financial problems as a reason for their decision to leave. However, he argued that "such statements are ex post facto forms of rationalization which mask rather than reveal primary reasons for their withdrawal" (Tinto, 1975, p. 81). Additionally, Tinto stated in the cost benefit analysis theory, developed out of the human capital theory of the

1960s, that individuals will direct all their energies toward activities that are perceived to maximize the ratio of benefits to costs over a given time frame. This perspective further contends that the tendency of an individual to withdraw from college will be a result of the individual feeling that his or her energies and resources directed to another form of investment will yield greater benefits, relative to costs, over time than persistence in college. From this perspective, persistence may be seen as a function of "fit" between the individual in terms of family background, motivation, commitment, and the institution's academic and social characteristics (Cabrera et al., 1992). Hippensteel (1995) described Tinto (1975, 1982, 1987) models as a refreshing approach, compared to the economic perspective that reduced persistence to cold decisions which mirrored the economic forces of weighing costs and benefits.

Tinto's (1975, 1982, 1987) student attrition model serves as a theoretical framework for a vast body of subsequent research on persistence (Cabrera et al., 1992; Leslie & Brinkman, 1988; Pascarella & Terrenzini, 1991; St. John, et al., 1991; Tierney, 1992).

Tierney (1992) has argued that Tinto's (1975, 1982,

1987) use of anthropological constructs such as Durkheim's (1951) theory of suicide and Van Gennep's (1960) rites of passage as a basis for student social integration in college is problematic. Problems with the model include a lack of cultural differentiation; an underlying focus on an individualistic perspective reflective of the Durkheimian approach, as opposed to a collective perspective; and the violation of basic anthropological and ethnographic considerations as a result of personal biases associated with the assessment process of who is to be integrated and how integration should take place (Tierney, 1992).

Tinto's (1975, 1982, 1985) model deconstruction, grounded in the criticism of Tierney (1992) that social integration assumptions may effectively discriminate against students from minority cultures, coupled with the potentially discriminatory nature of federal aid policies, indicates a fundamental need for reframing (St. John & Elliott, 1994). This reframing contributes to the quality of persistence research.

Bean Model

Bean (1980) advanced his first model of persistence based on the premise that student attrition behavior is similar to employee turnover in the work environment. His second model, which followed in 1983, focused more on psychological modeling and attitudes and beliefs, considered to shape behavior (Hossler, Bean, et al., 1990).

Similar to the Tinto model, the Bean model includes integration variables, both social and academic, which lead to institutional fit. Unlike the Tinto model, the Bean model addresses the issue of financial support within the background variables, and includes the lack of finances as an external variable influencing the decision to leave. Unfortunately, this approach presumes finances were not a barrier to access initially, and it treated students' financial aid simply as an organizational variable. Further, the model focuses on retention within a single institution (Hossler, Bean, et al., 1990).

Cabrera, et al., (1992) compared the Tinto model to the Bean model using the entering freshman class at a large Southwestern institution. The sample consisted entirely of traditional college age students who were enrolled full-time, to test convergent validity between the two models. Results showed that the two models were not mutually exclusive, rather that the models are complimentary when comparing the roles of the organization and student commitment variables. However, they concluded that a model integrating the leading factors found in both models may do a better job of explaining behavior (Cabrera, Castaneda, Nora, & Hengstler, 1992).

Pascarella and Terenzini's (1979, 1980) research had two purposes. First, it supported Tinto's concepts of academic and social integration variables by developing a multidimensional instrument to assess the major dimensions of these variables. Second, it helped determine the validity of the instrument in accurately identifying first year persisters or dropouts. Results of the study generally supported the predictive validity of the major dimensions of the Tinto model of educational persistence. Student-faculty relationships strongly contributed to group discrimination suggesting that the quality of student-faculty informal contacts may be as important to institutional integration and persistence as the frequency of such interactions.

The use of path analysis was employed to test Tinto's (1975) model of student withdrawal behaviors on first year students in a residential college (Pascarella & Terenzini, 1983). Variables in the model included socioeconomic background, institutional commitment and goal commitment, and academic and social integration. The results of this analysis were generally consistent with the expectations of Tinto's theoretical model.

National data bases such as the National Longitudinal Study of the High School Class of 1972, the High School and Beyond Study of the 1980 High School Senior Cohort (Peng & Fetters, 1978; St. John, 1989), and the National Post-secondary Student Aid Study of 1987 (NPSAS:87) (St. John, Oescher, & Andrieu, 1992) have made persistence studies possible on a national level. Unlike institutional studies, national studies employ various conceptual models, borrowing from economic perspectives, and include the social and economic variables needed to assess the effects of price and student aid. Additionally, these national studies provide a greater ability to generalize with respect to their findings.

St. John, Kirshstein, and Noell (1989) investigated the influence of student financial aid on enrollment decisions, using the National Longitudinal Study (NLS) of the high school classes of 1972, 1980 and 1982, and the High School and Beyond Study (HSB), developed by the Unites Stated

Department of Education, Center for Educational Statistics. They concluded that all types of aid packages had a positive effect on enrollment decisions by college applicants in all three of the classes. In addition, they found that all types of aid had a positive influence on the enrollment of minority students (St. John, Kirshstein, & Noell, 1989).

St. John (1989) examined the influence of financial aid on year-to-year persistence using the same National Longitudinal Study and High School and Beyond databases. He found that when loans were the only form of financial aid, there was a negative association with first-to-second year in the 1970's cohorts, but not in the 1980's cohorts. Additionally, he found all types of financial aid packages to be negatively associated with year-to-year persistence in both the 1970s and 1980s cohorts (St. John, 1989a; 1989b).

St. John, Andrieu and Oescher (1992) examined withing-year persistence using the National Post-secondary Education Study of 1987 (NPSAS:87). The study compared different approaches to measuring the influence of students' financial aid on persistence. The study focused on traditional-aged undergraduates attending four year colleges. This study found that when the receipt of financial aid variable was examined, they found a negative association between aid and persistence. These researchers argued that this should not be interpreted to mean that financial aid has a negative effect on persistence. Rather, it represents an interaction best explained as a result of insufficient financial aid. Furthermore, when the influence of different financial aid packages were examined, all package types, except work only and all three types of financial aid, were found to be negatively associated with persistence. Hence students receiving all three types of aid, including grants, loans and work, were found to have a negative influence on persistence. This further supports the position that the negative relationship previously discussed is the result of insufficient financial aid (St. John, Andrieu, & Oescher, 1992).

St. John (1990b) expanded on the traditional models of student persistence in a national sample of undergraduate students and replaced the factor termed commitment to the institution with individual aspirations, which is related to Tinto's (1975) variable called commitment. Tinto (1975) showed that the higher the level of education plans, the more likely the student remain in college. Since the U.S.

Department of Education reorganized student financial aid programs in 1972, researches have examined the important contribution of students' financial aid in student persistence (Carroll, 1987; Girves & Wemmerus, 1988; St. John, 1989; St. John Kirshstein, & Noell, 1991; Voorhees, 1985, 1997).

Financial Dilemma

Community college by design, with an "open door admission policy," are meant to attract and provide opportunity and access to a broad range of students who desire a postsecondary education at a cost lower than that of the traditional four-year college (Cohen & Brawer, 1996). Despite the attractiveness of its proximity and being a neighborhood institution, minority students are still over-represented at these institutions, which are the least costly, as well as the least prestigious of American colleges and universities.

Because of this disproportionate representation of minority student enrollment, persistence and completion rates have continued to be a major area of concern in higher education, prompting a series of explanations for the inequities in postsecondary education (Blackwell, 1991).

One important aspect of this problem has been tied to cost and the difficulty for many minority families to assume the cost of college for their children. However, Title IV of the Higher Education Act was created to provide need-based financial aid, thus, promoting equal educational opportunity for the disadvantaged (St. John, 1990).

Since 1965, the Higher Education Act has experienced several shifts in policy, particularly between 1975 and 1986 that resulted in the decline of grant aid from 80 percent to 46 percent and loans increasing from 17 percent to 50 percent of financial aid packages (Doob, 1993). The result of this is a further squeeze in the pool of minority student enrollment, and persistence in higher education.

Again, in 1992, another shift in policy that changed the formula for calculating eligibility for federal Pell Grants reflected the reality that families have the primary responsibility for their children's higher education costs. This is seen in the definition of an independent student, which "holds the family responsible for supporting the student until age twenty-four, unless the student has a child of his or her own, is married, is a veteran, is a graduate student or can prove independence" (Linsley, 1997,

p. 15).

All these shifts in policy have resulted in many families being caught in a tuition spiral as income failed to keep up with tuition. The median family income grew 31 percent between 1980 and 1985, but the cost of attending a public university increased 65 percent and a private university 81 percent. Yet, revenues from federal financial aid did not increase as fast as tuition, and other educational costs such as room and board also increased (Hubbell, 1992).

In 1991, federal financial aid declined from 83 percent of the total aid awarded to approximately 75 percent, while Pell Grants lost 30 percent of their purchasing power and about one-half of the states decreased their support to higher education (Hubbell, 1992; Waggaman, 1991). These changes have disproportionately affected disadvantaged Americans, the majority of whom need financial aid in order to enroll and remain in college once admitted.

Tinto (1982) noted that finance can be critically important to individual higher education careers. Although the thrust of the financial impact occurs at the point of entry, and finances may also impact dropout directly through short term fluctuations in financial need. Tinto (1982) further stated that "when students' experiences are positive, they are more likely to accept greater financial burdens in order to continue attendance, than when experiences are unsatisfactory" (p.690).

Terkla and Jackson (1984) further reported that several studies found that the cost of education has significant effects on matriculation decisions, and the amount of financial aid awarded also affects college attendance. However, it does not seem to matter because it appears that federal policy is ignoring the need to increase aid and promote access to higher education through increased funding and program improvement. Instead, policies are focusing on program cutting and neglecting the long-standing purpose of the program regarding "holding the doors of opportunity open for the widest variety of students" (Linsley, 1997, p. 23).

Community College Student Persistence

Extremely limited research has been conducted on persistence of students enrolled in community colleges utilizing a national data set, except St. John and Starkey (1994) and Hippensteel, St. John and Starkey (1996). Most previous persistence research studies of community college students were conducted on single institutions (Pascarella & Terenzini, 1991; Murdock, 1990; Leslie & Brinkman, 1988; Tinto, 1987). Previous national studies that considered combination of two-year and four-year students merely concluded that two-year college students are less likely to persist (Pascarella & Terenzini, 1991; St. John, 1989; St. John, Kirshstein, & Noell, 1991; Terkla, 1985; Astin, 1975).

St. John's (1990a) study of cost response in enrollment decisions showed that low-income students were more responsive to grant aid and tuition cost than middle-income and upper-income students. Similarly, other national studies have shown that students persistence decisions are also responsive to cost and cost subsidies (Andrieu & St. John, 1993; St. John, 1990a; St. John, Oescher, & Andrieu, 1992).

St. John and Starkey (1994) were the first to examine the influence of costs and cost subsidies on persistence by community college students in a national study. The model they utilized in their study was developed from a study of traditional college-age undergraduates in four-year colleges by (St. John, Oescher, & Andrieu, 1992), which was adaptable to the two-year college students. However, there were differences in the variables that were positively associated with persistence for the two- and four-year college populations. Social background variables that influenced persistence in the St. John and Starkey (1994) study were different from those that affected the decision of undergraduates in four-year colleges (St. John, Oescher, & Andrieu, 1992). St. John and Starkey's (1994) study indicated that "blacks in community colleges were more likely to persist, which was not the case in public 4-year colleges" (p.210). This suggests that community colleges may be responding better to the needs of black students who choose not to enroll in more expensive colleges due to financial constraints.

Additionally, St. John and Starkey (1994) based on their examination of the effects of financial factors on persistence, indicated that students that work were more likely to persist than students who did not work. Moreover, a great number of two-year college students were generally from low-income and lower-middle-income families and they also worked. This strongly suggests that community colleges provide a supportive environment for students that are self-supporting and willing to work to pay for their college education. There was also a strong negative relationship between tuition charges and persistence among community college students. Community College students seem to be more responsive to costs than students in other types of colleges, a contention consistent with Heller's recent meta analysis (Heller, 1997).

Hippensteel et al.'s (1996) study of the examination of within-year persistence decisions by adults enrolled in two-year colleges, indicated that such students were "negatively influenced by tuition charges" (p.240), which is consistent with findings regarding the within-year persistence study of undergraduates in four-year colleges (Andrieu & St. John, 1983; St. John et al., 1994; St. John & Starkey, 1994). It further indicated that available aid was not sufficient to promote persistence by adults in community colleges and that when tuition cost and student aid subsidies were included in the model analysis, "financial aid variables shifted from having a negative association with persistence to having a neutral or positive association" (Hippensteel et al., p. 240).

These studies indicate that community college students are highly responsive to tuition charges and available grant dollars are not sufficient to "mitigate" the negative influence of tuition on persistence. Consequently, it is contrary to the community college philosophy of providing a low-cost tuition option for students who could not afford to begin college away from home and above all, it limits access and opportunity.

Research studies have continued to show that finances like costs and student aid influence both choice and persistence patterns of behavior(St. John & Starkey, 1995; Hippensteel, St. John & Starkey, 1996; St. John, 1990a, 1990b; Leslie & Brinkman, 1988). Furthermore, students respond differently in both college choice and persistence decision to diverse kinds of cost and aid (St. John & Starkey, 1994; Hippensteel, St. John & Starkey, 1996). Sometimes, a student's withdrawal from an institution is seen as one's expression of their displeasure in the social, and, or intellectual life of the institution, instead of the result of a lack of adequate finances (Tinto, 1987). Although, either of these possibilities may be correct, students ultimately choose what college is worth the cost to them given their level of personal satisfaction with their postsecondary experiences (St. John, Paulsen & Starkey, 1996).

Aggressive enrollment management becomes critical in this context. Additionally, a better understanding and awareness about the role finances play in choice and persistence decisions of college students is imperative for federal policy makers, institutional researchers, and college administrators (Paulsen & St. John, 1997). If the intent and purpose of Title IV of the Higher Education Act (HEA) of 1965 is to have meaning, and community colleges are to continue to be a neighborhood institution for everyone that desires postsecondary education in the next millennium, promoting access and equalizing college opportunities for needy students is of paramount importance (Gladieux, 1995, Cohen & Brawer, 1996). Therefore, this study of the financial nexus between college choice and persistence decisions among community college students is timely and important. The nexus construct provides a means of examining the financial aspects of the interactions and interrelationships between college choice and persistence decisions.

A Theoretical Construct: The Financial Nexus Between College Choice and Persistence

The nexus between college choice and persistence lense draws our attention to how students' choices affect their persistence decisions (St. John, Paulsen & Starkey, 1996; Paulsen & St. John, 1997; Paulsen & St. John, forthcoming). Student choices about whether to go to college, and to attend a particular college, are complex. They are affected by background and personal characteristics such as socioeconomic status, academic ability, and pre-enrollment expectations about academic, social, and financial benefits and costs associated with attending a college or a particular college (Paulsen & St. John, 1997). However, upon enrollment, if a student's expectations are congruent with the experienced financial benefit and costs, that student's likelihood of persisting at that particular college is great, and if subsequent experiences and expectations regarding benefits and costs of attending become incongruent with pre-enrollment expectations, the decision to not re-enroll may become more plausible (Paulsen & St. John, 1997).

The purpose of this study is to examine the financial nexus between college choice and persistence among community college students. This study will draw from Paulsen, and St. John's (1997) theoretical perspective that provides insight to institutional researchers and administrators on the "influence of costs (tuition, housing, food, and travel) and financial aid (grants, loans, and work study)" (p.67) on the enrollment behavior of students (St. John, Paulsen & Starkey, 1996).

For a large number of students, their expectations regarding the financial factors can be an important calculation of costs relative to benefits in the choice of a particular college. Moreover, the results and effects of re-assessment of subsequent college experiences, actual dollar amounts and the financial factors in comparison to their perceptions, also influence persistence decision. It is important to note that students may be predisposed to choose or reject a college because of financial reasons as a product of their background and personal characteristics. The weight that a student ascribes to financial factors in the decision-making process of deciding to persist may be influenced by their background, personal characteristics and subsequent academic and social experiences. For example, students exist in a state of flux, always changing their minds, making "ongoing judgments about whether their academic and social experiences are worth the price they must pay, not only in tuition and living costs but also in time required for work" (Paulsen & St. John, 1997, p. 69).

Direct and Indirect Effects of Financial Factors

Previous national research has consistently noted the direct effects of tuition or aid (financial factors) on persistence (St. John, 1990b; St. John, Andrieu, Oescher, & Starkey, 1994; St. John & Starkey, 1995; Hippensteel, St. John & Starkey, 1996). But subsequent persistence decisions can be directly or indirectly influenced by the effects of financial factors that influenced college choice-that is, college-choice variables. When the benefits of attending a college of choice are perceived to be outweighed by costs, students may come to the conclusion that leaving that college of choice is the only solution that make sense; resulting in a direct effect of financial factors on persistence. On the other hand, some students that are in the same situation financially, may find that the effects of their subsequent evaluation of "the actual dollar costs are mitigated by financial aid and their own ability to manage part of the cost" (Paulsen & St. John, 1997, p. 68). In this case, when the financial reasons for one's choice of college interact with an individual's responsiveness to actual dollar amounts of financial variables during a subsequent persistence decision, it is an indirect effect of the college-choice variables on persistence.

The core of the financial nexus construct is "based on the interactions between students pre-matriculation expectations about financial factors that influence choice and their post-matriculation financial experiences and the way this interaction influences persistence decisions" (Paulsen & St. John, 1997, p. 68). The actual dollar cost in terms of the amounts for tuition, housing, food or travel, or actual amounts of financial aid by itself, may lead to substantial direct effects on persistence. Furthermore, "both finance-related reasons for college choice and the monetary measures of costs can be meaningfully classified, from the student's perspective, into categories of "fixed" and "controllable" financial variables" (St. John, Paulsen & Starkey, 1996).

Fixed-cost variables are considered as stable costs, or "fixed," at a particular point in time. Additionally, controllable-cost variables are costs that can be changed by student's efforts to manage and economize their resources. When students choose their college, at that particular point in time, there are costs that are already set by institutions that are "fixed," such as tuition and student aid. These are considered as fixed-cost, college-choice variables. Other cost-related variables at any point in time, such as living costs, and whether to have employment while going to college, are variables that students can control and are considered as controllable-cost, college-choice variables. In parallel fashion, the financial variables, which are the actual dollar amounts of monetary measures also include a combination of fixed cost variables (costs of tuition, and financial aid) and controllable-cost variables, such as living costs (housing, food and travel-related expense) and the choice about obtaining employment while going to college or not (Paulsen & St. John, 1997; St. John et al., 1996).

As mentioned earlier in chapter one, the NPSAS database will be used in this study because "it contains a range of financial variables and a corresponding set of college choice variables drawn from students' ratings of the importance of financial reasons for their college choice" (Paulsen & St. John, 1997, p. 69), making it very pertinent for this study of the financial nexus amongst community college students. However, no study has examined the financial nexus on this population, therefore, prior models will be mentioned next.

Prior Model Specifications

Based on the review of existing literature on model development, of prior persistence studies and the financial nexus studies on choice and persistence, using logistic regression, some of the variables that have been used in recent research were used in the present study (Hippensteel, St. John & Starkey, 1994, 1996; Paulsen & St. John, 1997; Paulsen, St. John & Starkey, 1995; St. John, Paulsen & Starkey, 1996).

St. John and Starkey (1994) and Hippensteel et al., (1996) used a model postulating within-year persistence of students enrolled in two-year colleges as a function of background, high-school experience, expected earnings, individual aspirations and financial factors. Paulsen and St. John (1997) postulate that the financial nexus on college choice and persistence is a function of interactions between students' pre-matriculation expectations about financial factors and their post-matriculation financial experiences and the way these interactions influence persistence decisions.

In this study, continuous and dichotomous variables were used much like they were used in the prior models mentioned above. Independent variables are typically classified as social background, high school experience and financial background, college experiences, aspirations, and different factors of price and price subsidies. Persistence is the dichotomous dependent variable.

Variables Selection for the Proposed Model

Five sets of variables will be viewed as a function of persistence in the model for this study. These sets of independent variables include: student background, college-choice variables, college-experience variables, educational aspirations, and prices and price subsidies. Financial factors will include expectations about tuition and financial aid before matriculation, and the actual dollar amounts of tuition, financial aid and living costs, based on experiences after matriculation. In chapter three, a detailed description of each set of independent and dependent variables will be discussed for the present study.

Conclusion

In conclusion, the theoretical framework for this study is derived from several sources: sociological research on educational attainment, institutional persistence studies, economic theory, national persistence research and research on the financial nexus between student choice and persistence. Sociological attainment considered factors like socioeconomic background and educational attainment. Institutional persistence studies examined factors that influenced persistence within a single institution. The economic studies addressed price responses and investment in human capital. This study is primarily rooted in human capital theory, but is adapted from the appropriate persistence models of other national persistence studies.

Additionally, the nexus between student choice and persistence research for four-year colleges also serves as the basis for this study. This study will examine the effects of student background, perceptions or expectations about costs (financial reasons for choosing a college) college experiences (including measures of student achievement in college), current aspirations, and finances, utilizing an important feature of the nexus approach that examines the influence on persistence of both cost-related factors that students considered important in their choice of college and prices nd subsidies students encountered at the time of subsequent persistence decisions (Paulsen & St. John, forthcoming).

Based on the review of the literature, no prior research has examined the financial nexus between college choice and persistence among community college students. Specifically, this study examines the influence of a set of college-choice variables related to the financial reasons for choosing a college on whether students stay in their college of choice, focusing on access and educational opportunity, especially for lower-income and minority students, who attend community colleges in disproportionate numbers. Above all, the study examines how effective the Higher Education Act, Title IV, has been in promoting educational opportunity for lower-income and minority student populations.

This study will use the National Postsecondary Student Aid Study, 1987 (NPSAS:87), as its source of data. Therefore, the development of a viable model, examining the financial nexus between college choice and persistence among community college students will contribute to the body of knowledge in this area.

Conceptual Framework

The most prominent feature of the nexus between college choice and persistence is that it focuses attention on how students' initial college choices affect their subsequent persistence decisions; by examining the influence of cost-related variables that students view as important in their choice process of choosing a college (Paulsen & St. John, 1997; forthcoming). Figure 1 presents a diagram of the framework for this study of the financial nexus between college choice and persistence for community college students. The square boxes with very heavy borders in the diagram represent the five sets of independent variables, and the heavy lines going in and out of each of these variable categories indicate their direct effects on persistence.

The rounded edge boxes with light lines represent the decision-making processes of pre-college admission expectations; including financial expectations of attending a college about aid, tuition and living costs; and pre-college admission assessment to a decision point (the circle) of choosing a college; which then forms an implied contract between the student and the institution. Pre-college assessment and post-college admission experiences at this college of choice are both influenced by background and personal characteristics. If the post-college admission reassessment of the benefits and costs of attendance are congruent with earlier perceptions, students are most likely to see the implied contract as intact and decide to persist at that college. However, if students' subsequent experiences and perceptions of the benefits and costs of attendance are incongruent with their pre-admission expectations, a decision to depart may be very likely.

It is important to note that core of the nexus is the interactions between students pre-admission expectations about financial factors that influence their initial college choice and their post-admission financial experiences and the way this interaction influences persistence decisions.

The variables of perceptions and expectations that various students posses regarding the financial aspects of enrollment decision-making can provide valuable information about students' ability to afford their college education at the decision point of choosing the college to attend. This can be enormously helpful to those engaged in aspects of enrollment management in postsecondary education.

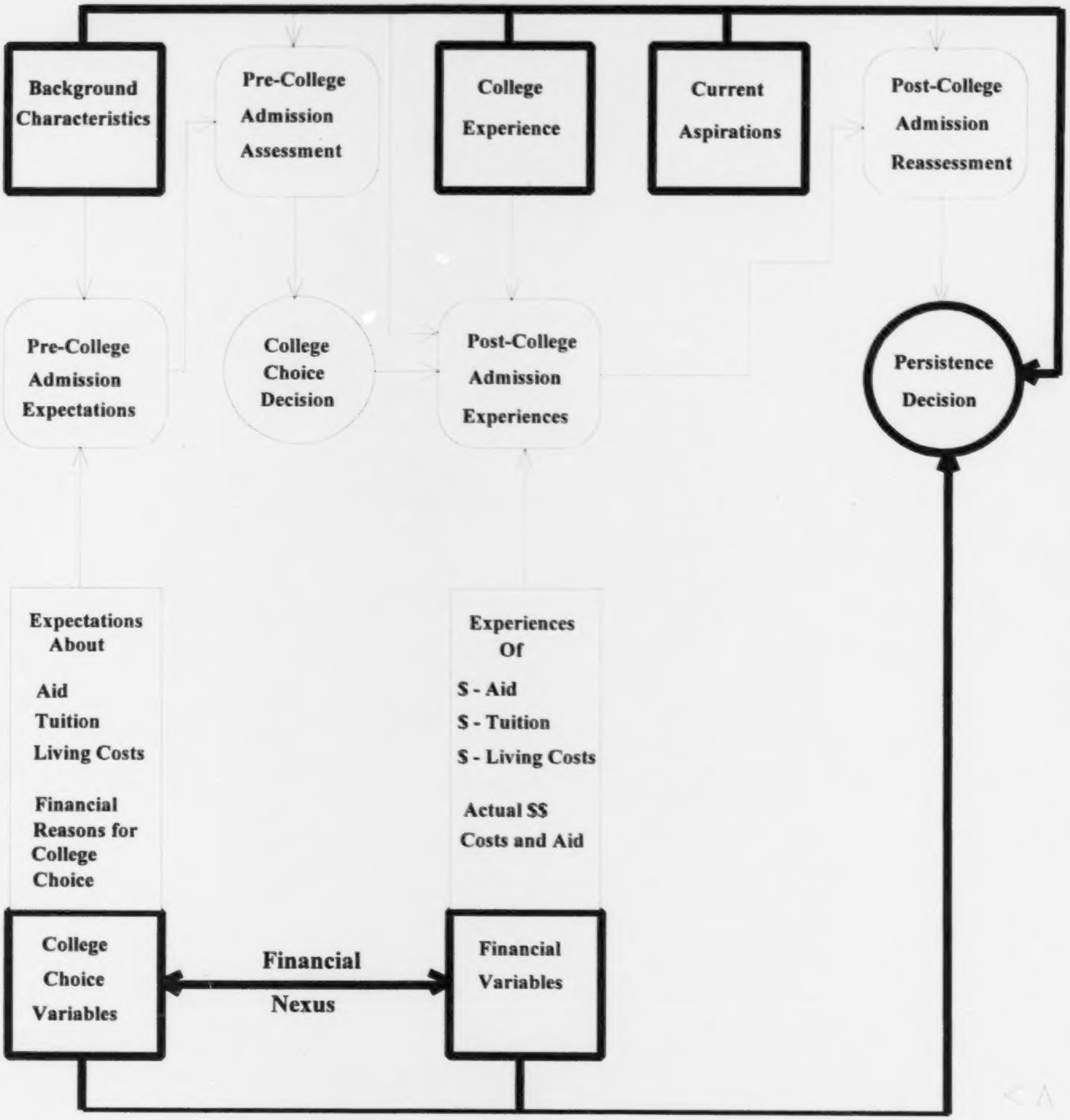

Figure 1: The Financial Nexus Between College Choice and Persistence for Community College Students

Background Characteristics
Pre-College Admission Assessment
College Experience
Current Aspirations
Post-College Admission Reassessment
Pre-College Admission Expectations
College Choice Decision
Post-College Admission Experiences
Persistence Decision
Expectations About
Aid
Tuition
Living Costs
Financial Reasons for College Choice
Experiences Of
$ - Aid
$ - Tuition
$ - Living Costs
Actual $$ Costs and Aid
College Choice Variables
Financial Nexus
Financial Variables

CHAPTER THREE

METHODOLOGY

Introduction

The purpose of this study is to examine the financial nexus between choice and persistence among community college students. The study also develops a financial-impact model using the National Post-secondary Student Aid Study, 1987 (NPSA:87). In particular, this study will use the market-based, financial-impact model of the college choice-persistence nexus (Paulsen & St. John, forthcoming; Paulsen & St. John, 1997; Paulsen et al., 1995; St. John et al., 1996), to examine the nature of this nexus as experienced by community college students. In addition, this study will examine the implications of state, federal, and institutional financial strategies for postsecondary education. The intent of this is to help institutional researchers and administrators gain additional insights into the influence of costs (tuition, housing, and food) and financial aid (grants, loans and work) on the enrollment behavior of students who attend community colleges. This will be accomplished by utilizing the reconstructed choice-persistence or nexus theory which has recently provided a new lense for viewing persistence--decision-making behavior. Furthermore, in developing the financial-impact model, student background factors, financial reasons for choosing a particular college (the college-choice variables), college experiences, postsecondary aspirations, and the actual financial or monetary costs -- tuition, aid, housing and food-- are assumed to influence students when their persistence decisions are made.

This chapter specifically addresses the methodology that will be used, which draws on prior research (Hippensteel, St. John & Starkey, 1996; Paulsen & St. John, forthcoming; Paulsen & St. John, 1997; Paulsen, St. John & Starkey, 1995; St. John, Paulsen & Starkey, 1996; St. John & Starkey, 1994, 1995) in order to accomplish the objectives stated above. Furthermore, this chapter has sections on the sample, statistical methods, limitations, and model specifications. This study will use the refined version of the financial nexus model (Paulsen & St. John, forthcoming) in examining choice-persistence by students attending community colleges.

Sample For The Study

The sample for this study was drawn from the National Post-secondary Student Aid Study of 1987 (NPSAS:87). The NPSAS:87 survey was conducted by the United States Department of Education to fill the gap of a comprehensive national database on postsecondary student financial aid (Hippensteel, 1995). The sampling procedure used by the U.S. Department of Education for NPSAS:87 surveyed a sample of college students (47,000) in the fall of 1986, of which 4,091 were community college students. This survey was followed-up with questionnaires administered in the spring of 1987 (Korb, Schantz & Zimbler, 1989). Students who originally enrolled for twelve or more hours, as well as those who initially enrolled for twelve or more hours and later dropped down to less than twelve, were included in the full-time sample. Only those students who originally enrolled for less than 12 hours were considered in the part-time sample. These samples were further divided into full-time traditional and non-traditional-age students and part-time traditional and non-traditional-age students. This database is rich, fruitful and appropriate in the examination of different factors on within-year persistence decisions among college students.

NPSA:87 is also appropriate for this study because the shift in policy toward higher tuition, emphasizing lower grants and more loan aid, started in 1980 and well before NPSAS:87 was completed. This policy is also a shift which has continued through the 1990s. Therefore, the timing of the survey was situated around the middle of the period of changes in policies in the financing of higher education. NPSAS:87 also over-sampled students with diverse characteristics, such as the minority group populations, in an effort to study trends in costs and aid among such groups. That makes it important for this study to use the weights computed by the National Center for Educational Statistics (NECS) to redistribute the observations to ensure a representative distribution. A sub-sample of the total NPSAS:87 will be used in the present study, consisting of 4,091 students who were enrolled as undergraduates in two-year colleges and who responded to the NPSAS:87 survey. The overall response rate on the spring questionnaire was 72 percent (Korb, Schantz, & Zimbler, 1989).

Statistical Procedure for the Study

In order to analyze the relationship and the interactions between dependent variables and one or more independent variables, logistic regression methodology was used. Because of the dichotomous nature of educational outcomes, like whether or not a student makes the choice to enroll, persist, or attain a degree, logistic regression is an appropriate statistical technique for this study (Cabrera, 1994; Menard, 1995). Furthermore, sequential logistic regression has been deemed appropriate in other studies that utilized qualitative dichotomous outcome or dependent variables such as persistence (Hippensteel, St. John & Starkey, 1996; Paulsen, St. John & Starkey, 1995, Paulsen & St. John, 1997; Paulsen & St. John, forthcoming; St. John, 1990; St. John, Oescher & Andrieu, 1992; St. John & Starkey, 1994, 1995). Also, the logistic probabilistic distribution is consistent with the S-shaped distribution that is characteristic of dichotomous or binary outcome variables such as persistence (Aldrich & Nelson, 1984). The variables that will be examined include college-choice and financial variables, which include variables that will control for the effects of students' background and personal characteristics, college experiences, and their post-secondary aspirations as assessed during college (Paulsen &

St. John, 1997).

The most important value of the logistic regression for the purpose of this study is that the outcome or dependent variable that is under study is dichotomous in nature. The dependent variable in this study is within-year persistence. This variable can only assume two values, either the student persists (yes), which would get a code of "1", or he or she did not (no), which would be coded as "0". This again appropriately satisfies the constraint that the conditional mean of the equation must have a range of 0 and 1, permitting the use of both discrete and continuous variables. It also avoids violating the homoscedasticity assumptions that are associated with the direct application of widely-used linear models. Linear regression is not as effective in handling dichotomous outcome variables because it predicts probabilities of persistence outside the range of 0 to 1 (Aldrich & Nelson, 1984; Hosmer & Lemeshow, 1989).

The logistic regression produces a Baseline P statistic which will be based on the average probability of persistence for each of the sub-samples of the entire NPSAS:87 sample that are used in this study. It is the number of persisters from spring of 1987 divided by the total number of students enrolled in the fall of 1986 of the community college sub-sample of the NPSAS:87. The baseline P has been used in other studies of within-year persistence among community college students (Hippensteel et al., 1996; St. John & Starkey, 1994). Hence, logistic regression estimates the influence of the independent variables on the dependent variable and computes regression coefficients for the effects of each independent variable. The coefficient estimates for all variables were converted to changes-in-probability measures (delta-p statistics) utilizing the Petersen (1984) technique.

Delta-p

The delta-p statistic for each dichotomous variable in the model under study provides an estimate of the difference in the probability of persistence for students with the characteristic being measured by the dichotomous variable compared to those in a base or comparison groups. This will be calculated from the logistic regression parameter. The statistic will represent the extent to which the baseline-p is likely to increase or decrease--dependent on the sign, positive or negative--for a given unit change in the value of the independent variable being considered. For example, tuition is measured in $1,000 units, therefore, a delta-p of -.25 indicates that, all else being equal, a $1,000 increase in tuition would be associated with a 25 percent decrease in the probability of persistence (Fine, 1998; Paulsen & St. John, 1997; Paulsen & St. John, forthcoming; St. John, Paulsen & Starkey, 1996). Hence, the delta-p statistic can be interpreted as a standardized price response measure in persistence. It estimates the change in probability of persistence associated with the presence of a characteristic (for a dichotomous variable such as race) or a unit change in the value of a continuos variable such as aid. The delta-p indicates the estimated increase or decrease in the baseline-p for a unit change in the independent variable. For example, in measuring the effects of the amount of a grant (financial variable), a delta-p of .05 for grant -- measured in $1,000 units --indicates that, all else being equal, a $1,000 increase in grants would mean that a student would be five percent more likely to persist for each $1,000 (the incremental unit that will be used for financial variables in this study) increase in the amount of the grant received. Furthermore, each level of delta-p significance will be identified.

The formula for calculating delta-p statistics as recommended by Petersen (1984) is:

$$\text{Delta-p} = \exp(L_1)/\{1+\exp(L_1)\}-\exp(L_0)/1+\exp(L_0)\}$$

Where:

$$L_0 = \text{Log}\ \{\text{Baseline P}/(1-\text{Baseline P})\}$$

and

$$L_1 = L_0+\text{Beta}$$

Pseudo-R^2

Pseudo R-squared is another statistic that will be calculated from the logistic regression. The pseudo-R^2 statistic measures the portion of the variance in the dependent variable that is accounted for by the independent variables; indicating that the dependent variable can be better predicted from the independent variable than could be predicted from dependent variable if independent variables were missing using the regression procedure (Menard, 1995). Pseudo R-squared is proportional-reduction-in-error measure due to the fact that it provides an indicator of the proportion of variance in the dependent variable explained by the independent variable (Cabrera, 1994).

The proportional reduction in error will be calculated by subtracting the -2 log-likelihood statistic for the model from the -2 log-likelihood statistic for the model containing the intercept only and dividing this by the latter. The result is the pseudo-R^2 (St. John, Kirshstein, & Noell, 1991). Additionally, if the pseudo-R^2 between the steps in the series of logistic regression increases, there will be a reduction in unexplained error (St. John et al., 1991). When the log-likelihood is multiplied by -2, it will have approximately a chi-square distribution (Menard, 1994, Fine, 1998).

The sequential logical steps will be used to "step-in" variables in sets that can provide meaningful explanation of direct effects on persistence and the interactions of the variables that will be entered in a systematic way. Two stages with appropriate sets of variables will be sequentially stepped in for the analysis in a process that follows the established order of persistence behavior based on past research (Andrieu, 1991; Paulsen & St. John, 1997; St. John & Starkey, 1995; St. John et al., 1991). Step one includes pre-college factors representing the students' background (race, gender, mother's educational attainment, age) and personal characteristics (marital status, high school experience, employment status, dependency status and income level); college choice variables (fixed costs - financial aid, low tuition cost, tuition and financial aid; controllable costs - low living cost, could work, living cost and work), college experiences (year-in-school, college grades); and post-secondary aspirations (assesses long-term educational attainment goals of college attendance). College-choice variables correspond to the initial or early commitments in past persistence studies that did not include aid or prices, while current aspirations correspond to latter commitments by students.

Step two includes the financial variables of tuition and several types of aid (grants, loans, work study), and the financial variables of housing and food costs. As can be seen, this approach not only permits a controlled examination of the direct effects on persistence of the college-choice and financial variables (while controlling for background and personal characteristics, college experiences, and aspirations), but also permits analysis and interpretations of the interactions between college-choice variables and each of the sets of financial variables, based on step-wise analysis (St. John, et al., 1996). The sequential addition of the variables allows the researcher to determine which factors influence choice and persistence, which ties into the purpose of this study: to examine the financial nexus between college choice and persistence. Utilizing this sequence provides the most "...unbiased estimates possible of the direct effects of financial factors on persistence decisions, as well as the examination of the interactions with other factors, particularly the two sets of finance-related choice variables" (St. John, Paulsen & Starkey, 1996, p. 194).

Furthermore, goodness-of-fit measures assess the effectiveness of the model in predicting or explaining the outcome variable in terms of the independent variable. The model chi-square statistic permits a test for the joint statistical significance of all of the variables in each of the two stages estimated. It can be calculated as follows:

$$X^2 = G^2_0 - G^2_a$$

G^2_0 represents the -2 Log L value for the logistic regression including only the intercept, while G^2_a represents the value of -2 Log L for the logistic regression model including the independent variables as well as the intercept. Model X^2 is computed by SAS PROC LOGISTIC and can be seen in the "Chi-Square for Covariates" column of the

-2 Log L command (Menard, 1995, Lyn, 1998). The chi-square model statistic is the difference between the -2 log-likelihood for the model with the intercept only and -2 log-likelihood for the model when the covariates (independent variables) are considered also. The difference corresponds to the variance in the dependent variable that is explained by the independent variables. The model can be tested for statistically significant predictive ability by testing based on the chi-square statistic. Hence, if model chi-square is statistically significant ($p<=.05$), then we reject the null hypothesis and conclude that the independent variables provide better predictions than are possible without the independent variables (Menard, 1995; Fine, 1998). "The statistic also permits a test for the joint significance of just the new variables added in each step" (Paulsen, St. John & Starkey, 1995, p. 194).

Another goodness-of-fit measure is the Somer's D statistic, which will also be used for each logistic regression in this study. It is a product of the SAS PROC LOGISTIC procedure. It primarily provides information that assesses the goodness-of-fit between the estimated model and the data. The Somer's D is a "...rank-order correlation measure of the association between predicted probabilities and observed outcomes for the dichotomous dependent variable" (Paulsen, St. John & Starkey, 1995, p. 194-195). The Somer's D is analogous to R-squared for large samples in ordinary least squares regression (Somers, 1992).

Limitations

The primary statistical limitation associated with the use of NPSAS:87 data in this study, is the absence of certain variables such as precollege student ability measures like high school grades or entrance test scores, and comprehensive measures of social and academic integration.

Additionally, there are some missing values which are very small in number and appear to be randomly distributed and not considered problematic. Students with missing values for one or more variables were excluded from the sample, and only students enrolled in the fall semester were included in the sample.

A possible limitation of this present study is that NPSAS:87 does not have information on student achievement in high school. However, because college grades and high school achievement are often highly correlated, the lack of such a measure is not particularly problematic (Hippensteel, St. John & Starkey, 1996). Although a more comprehensive set of high school experience variables might increase the predictive ability of the model, there is no reason to suspect that adding such variables would influence the results of this study for the finance-related college-choice variables or of the market-based financial variables. Furthermore, this study will examine the influence of two variables related to high school completion, which have consistently explained significant portions of variation in prior studies in relation to persistence.

Another possible limitation of this study involves the lack of comprehensive measures of social and academic integration in the NPSAS:87 database. However, the NPSAS:87 database provides a rich set of market-based measures of financial factors. Just as mainstream "integrationist" studies of persistence (Pascarella & Terenzini, 1991) have never included any adequate measures of market-based financial factors, "financial-impact" studies of persistence, such as the present study, have used only limited measures of social and academic integration (St. John, Paulsen & Starkey, 1996). However, the existence of omitted relevant variable bias in estimates of the effects of various factors on persistence requires that an excluded variable be correlated with both the dependent variable (persistence) and one or more included independent variables. There is no evidence to date that comprehensive integration measures are correlated with market-based measures of financial factors. Therefore, there is no empirical basis for arguing that there is omitted relevant variable in either intregrationist models which exclude adequate financial variables or in financial-impact models which exclude adequate integration measures. Clearly, this is a matter to be further investigated if and when researchers are able to examine the relations among these two sets of measures in a more completely-specified persistence model than any developed to date.

The logistic regression model provides possible constraints because it is based on the assumption that there is a measurable relationship between the independent variables and the dependent variable, and that the appropriate and relevant factors were included in the model.

Model Specifications

Some of the variables in the statistical model for this study were dichotomous (persistence = 1, non-persistence = 0). The dependent variable for this study was within-year persistence. Students were considered persisters if they enrolled during the fall semester and re-enrolled during the spring semester. Other students were also considered persisters if they enrolled during the fall semester and earned their degree prior to the beginning of the spring semester or if they stated that they had met their educational goals (Hippensteel et al., 1996; Paulsen & St. John, forthcoming; St. John, et al., 1996). Persistence variables were coded as a dichotomous outcome measure.

Five sets of independent variables were considered in this proposed logistic regression model: student background, college-choice, college-experience, aspirations, and financial variables. Most of the independent variables were coded as either individual dichotomous variables or into design sets of dichotomous variables. Only age and all the financial variables were coded as continuous variables. All independent variables and their coding are specified in Appendix "A".

Student Background

The background variables for this study were ethnicity, gender, age, marital status, high school experience, dependency status, mother's education, family income, and whether the student was employed. Prior research on persistence and the financial nexus has demonstrated the importance of background variables in the model development (Andrieu, 1991; Fine, 1998; Hippensteel, St. John & Starkey, 1996; Lyn, 1998; Mbadugha, 1993; Paulsen & St. John, 1997; Paulsen, St. John & Starkey, 1995; St. John, Paulsen & Starkey, 1996; Somers, 1992; Starkey, 1994). Ethnicity, family income and mother's education were coded as design sets of dichotomous variables. The effect of ethnicity will be measured separately. African-Americans, Latinos and Asians were compared to other students with none of these backgrounds. Mother's education was measured by comparing students whose mothers completed less than high school, college degrees, master's degree, and advanced degrees to those students whose mothers had a high school education and high school students with GEDs and without high school diplomas were compared to students with high school diplomas. Gender differences were assessed by comparing male with female students. Married students were compared with those students that are unmarried; working students will be compared to those students who are not employed; and age was treated as a continuous variable (Paulsen & St. John, forthcoming).

Mother's education was used in the model rather than either parents' education or father's education based on both empirical and logical considerations. Previous research has indicated that mother's education predicts persistence better than either parent's education or father's education (St. John, Kirshstein, & Noell, 1991). Primarily, this is because "...many students are from single-family homes headed by mothers and mothers are generally more directly involved than fathers in helping children with their homework" (St. John, Paulsen & Starkey, p. 191, 1996).

Income

Income is the total amount earned by the student (and spouse, if married) as reported by the student on the Federal student aid application form. The income variable was stratified into four groups, which is consistent with prior research using NPSAS:87 data (e.g., St. John & Starkey, 1995): low-income students with income less than or equal to $11,000; lower-middle income students with income above $11,000 but less than $30,000; upper-middle-income students with income of at least $30,000, but less than $60,000; and upper-income students had income equal to or greater than $60,000. The comparison group will be the lower- middle-income students. Low-income, upper-middle-income students and upper-income students were compared to lower-middle-income students.

Financial background variables also included a dichotomous dependency variable, and a dichotomous variable for students that are employed off-campus (coded "1" for yes and "0" for no).

High School Experience

For the high school experience measure, the receipt of a General Educational Development (GED) certificate and those students with no high school diploma were compared to students with high school degrees, using a design set of two dichotomous variables.

College Choice

Two design sets of dichotomous variables were used to measure college-choice variables, as measures of the perceptions and expectations about college costs held by students when they chose their colleges. The first set of variables provided an indication of the ways students viewed their fixed-costs in relationship to choosing their college of choice. Students who thought financial aid, low tuition, or both low tuition and student aid were very important in their college-choice were compared to students who did not consider any of these fixed cost variables as being very important. These variables provide information indicating students' expectations or perceptions about the costs of attending. Additionally, a design set of dichotomous variables in terms of controllable costs were coded according to the financial factors that enable students to keep their own costs down and or earn more money while in college. These variables were used to compare students who rated low living costs, being able to work, or both living costs and could work, as being very important in their college-choice process. All controllable costs are within the control of the student. The student can choose to only work for a limited number of hours per week, but will not eat out, engage in any social life that will cost him or her money. These are choices that a student can influence positively or negatively. On the other hand, a fixed-cost factor (e.g., tuition) is set by the institution, and the student cannot influence that cost at all. All these variables are critical in the college-choice decision-making process. The examination of these college choice-related variables across various sub-samples of community college students can provide information about access and equal opportunity, by considering lower-income and minority students' perceptions of ability to manage the affordability of going to college.

College Experience

College experience variables are related to social and academic integration processes, and included years in college and grades received in college. In order to study the effects of these variables, the parameters were estimated for each of five sub-samples of community college students in this study.

Current Aspirations

Current aspirations were coded as a design set of dichotomous variables (vocational, some college, master's degree, and advanced degree). Students whose aspirations are to complete a vocational training, some college, master's degree, or advanced degree were compared to students who aspire to attain a bachelor's degree. Students' postsecondary aspirations were assessed after they had made their re-enrollment decision. Thus, the aspirations measure used in this study is not a student background factor. Instead, it represents a later goal commitment made by students about their plans for educational attainment (Cabrera, Stampen & Hansen, 1990).

Financial Variables

Financial variables in this study were coded into two categories of fixed-cost and controllable-cost. The fixed-cost (costs set by the institution and fixed at the time of a subsequent persistence decision) factors are tuition and financial aid (grants or scholarships, loans, and work-study), over which the student have no control and cannot be changed. The controllable costs include food and housing costs (that measures both on-campus and off-campus food and residence costs) which are within the control of the student. This means that, the student can make changes in the amount they spend at any given time and on whatever item of choice.

Finances were also treated in this study as actual dollar amounts of tuition, aid, and living costs. All of these financial variables are continuous variables that express actual costs in units of $1,000 (see Appendix "A").

Conclusion

This study examined the financial nexus between college choice and persistence among community college students using a financial-impact model, based on NPSAS:87 data. Two separate sets of variables were stepped-in and examined sequentially using logistic regression statistical methodology. This statistical procedure made it possible to assess the direct effects of variables on persistence, as well as their interactions. The results of the study are presented in the next chapter.

CHAPTER FOUR

INTRODUCTION

This study used a logistic regression model to examine the financial nexus between college choice and persistence among community college students. This financial-impact model specifically examined the effects on student persistence of a set of college-choice variables related to the financial reasons for choosing a community college and a set of financial variables--market-based measures of the actual dollar amounts of costs and aid at the time of a subsequent persistence decision. Previous research has indicated that student responsiveness to financial factors differ substantially between full-time and part-time students, and between students of traditional and non-traditional age (Hippensteel et al., 1996; St. John & Starkey, 1994; Starkey, 1994). Therefore, to obtain more accurate parameter estimates of student responsiveness to financial factors, it was necessary to divide the overall sample of community college students into sub-samples of full-time and part-time students. These two sub-samples were then further divided into additional sub-samples of traditional and non-traditional full-time students, and traditional and non-traditional-age part-time students. In this study, full-time students were those students that enrolled for 12 or more credit hours, on a per-semester basis, while part-time students were those enrolled for less than 12 credit hours. The influence of background, college choice, college experiences, aspirations, and financial variables on persistence were also considered in this study. As shown in Table 2, these variables were added in a two-step sequence. The first step constituted the initial model of persistence and included all variables measuring aspects of student background, college choice, college experiences and aspirations. The second step constituted the financial model of persistence and included the variables in the first step as well as the four types of financial variables, including the fixed-costs or subsidy measures of grants, loans, work-study, and tuition; and the controllable costs measures of food and housing expenses.

This chapter presents descriptive statistics for the overall sub-sample of full-time and part-time students, and the four corresponding sub-samples of students of traditional and non-traditional age. Then the logistic regression results are presented, analyzed, and compared for the overall full- and part-time sub-groups. The results are categorized by the different variable groups--background, college choice, college experiences, aspirations, and financial variables (fixed-costs and controllable costs). The goodness-of-fit of the models is discussed. Then, the logistic regression results for the four corresponding sub-samples of traditional and non-traditional age students in the two overall sub-groups (full-time and part-time) are presented and compared, in order to assess inter-group differences.

Descriptive Statistics

The NPSAS:87 sample used in this study included a total of 4,091 community college students, which consisted of 2,351 full-time students and 1,740 part-time students. Descriptive statistics for these groups appear in Table 1. The sample size for the traditional-age full-time students was 1,744 and the sample size for full-time non-traditional-age students was 607. Descriptive statistics for these full-time sub-groups appear in Table 1. The sample size for part-time traditional-age students was 579, while the sample size for the part-time non-traditional age student was 1,161. Descriptive statistics for these part-time sub-groups appear in Table 1. In the following section, the descriptive statistics for each variable and variable category are compared across all four sub-samples examined in this study, before moving onto the next variable or variable category. This approach allows the reader to see the patterns in the data, with a special emphasis on similarities and differences between students in the six samples studied, for each individual variable or set of variables.

Social Background. The influence of social background variables--such as African American, Latino, Asian, gender, mother's education and marital status--on within-year persistence for community college students have been examined in prior national studies (Hippensteel, St. John & Starkey, 1996; St. John & Starkey, 1994). The financial nexus between college choice and persistence in the present study incorporated these variables, but focused primarily on the college-choice and financial variables that form the heart of the financial nexus (Paulsen & St. John, 1997; St. John, Paulsen & Starkey 1996).

Table 1

Descriptive Statistics for all Samples

Population	Full-Time	Part-Time	FT Trad	FT Ntrad	PT Trad	PT Ntrad
Social Background:						
Ethnicity						
African-American	7.4%	9.4%	6.5%	10.2%	9.3%	9.4%
Latino	5.4%	6.4%	5.1%	6.1%	7.4%	5.9%
Asian	3.8%	3.7%	3.1%	5.8%	5.0%	3.0%
Other	83.4%	80.5%	85.3%	77.9%	78.3%	81.7%
Gender						
Male	44.3%	41.7%	45.0%	42.3%	49.7%	37.7%
Female	55.7%	58.3%	55.0%	57.7%	50.3%	62.3%
Mother's education						
less than H.S.	19.2%	24.8%	13.6%	35.3%	11.9%	31.3%
high school degree	35.6%	37.3%	35.6%	35.2%	38.1%	36.9%
some college	24.5%	24.1%	26.7%	18.3%	30.9%	20.7%
college degree	12.5%	9.0%	14.3%	7.6%	12.6%	7.2%
master's degree	5.1%	3.6%	6.1%	2.3%	4.8%	3.0%
Advanced degree	3.1%	1.2%	3.7%	1.3%	1.7%	0.9%
Age (yrs)	22.1	28.4	19.2	30.4	19.0	32.6
Married	14.2%	41.3%	4.5%	41.8%	9.0%	57.4%
High School Experience:						
GED	5.7%	7.9%	1.9%	16.5%	3.5%	10.2%
No H.S. degree	3.6%	4.9%	3.0%	5.1%	3.3%	5.8%
H.S. diploma	90.7%	87.2%	95.1%	78.4%	93.2%	84.0%
Employment:						
working	57.0%	82.0%	59.3%	50.6%	80.8%	82.5%

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	Full-Time	Part-Time	FT Trad	FT Ntrad	PT Trad	PT Ntrad
Dependency Status:						
independent	20.5%	52.5%	4.8%	65.6%	10.0%	73.7%
Income:						
lower	23.9%	23.0%	17.0%	43.5%	20.2%	24.5%
lower middle	33.5%	37.8%	33.0%	34.5%	32.1%	40.5%
upper middle	34.8%	33.7%	40.4%	18.9%	39.6%	30.8%
upper	7.8%	5.5%	9.5%	3.1%	8.1%	4.2%
College Choice:						
Fixed Costs						
Financial aid	17.8%	7.2%	16.4%	21.7%	7.1%	7.3%
low tuition cost	26.0%	34.5%	26.8%	23.9%	40.2%	31.7%
tuition and financial aid	19.7%	10.7%	19.0%	21.6%	10.7%	10.8%
Controllable Costs						
low living cost	15.2%	5.2%	15.5%	14.2%	7.8%	3.9%
could work	22.7%	52.9%	20.3%	29.5%	43.4%	57.6%
living cost and work	17.4%	18.7%	18.6%	14.0%	25.2%	15.5%
College Experience						
Years in College						
freshman	58.4%	55.5%	59.9%	33.9%	59.8%	53.4%
Grades						
below c	7.8%	7.5%	9.3%	3.5%	12.6%	5.0%
mostly c	24.0%	21.8%	25.3%	20.1%	26.8%	19.4%
B average	23.7%	27.1%	20.7%	32.2%	15.3%	32.7%
Mostly A	2.9%	8.7%	1.8%	6.1%	3.3%	11.5%
Not reported	41.6%	34.9%	42.9%	38.1%	42.0%	31.4%
Aspirations:						
vocational	8.0%	7.9%	6.6%	12.2%	8.1%	7.8%

	Full-Time	Part-Time	FT Trad	FT Ntrad	PT Trad	PT Ntrad
some college	25.1%	34.1%	22.7%	31.8%	27.6%	37.3%
college	40.5%	40.5%	42.3%	35.4%	40.9%	40.2%
master's	19.5%	13.5%	20.8%	14.8%	16.8%	11.9%
advanced	7.1%	4.0%	7.6%	5.8%	6.6%	2.8%
Financial:						
Fixed Costs						
grants $	$1,025	$225	$ 994	$1,115	$ 236	$ 236
loan $	651	139	628	715	144	127
work $	57	7	54	63	06	09
tuition $	$1,621	362	$1,744	$1,265	353	381
Controllable Costs						
food/housing $	$1,060	341	$1,175	727	317	387
Model N	2,351	1,740	1,744	607	579	1,161

Ethnicity. In the full-time sample, 7.4 percent of the students were African-American, 5.4 percent were Latino, 3.8 percent were Asian, and nearly all of the remaining 83.4 percent of the students (other) were Caucasian. However, in the part-time sample, 9.4 percent of the students were African-American, 6.4 percent Latino, 3.7 percent were Asian and 80.5 percent were other--nearly all of whom were Caucasian. In the sub-sample of full-time traditional-age students, 6.5 percent were African American, 5.1 Latino, 3.1 Asian and 85.3 were other (nearly all Caucasian); and among the full-time non-traditional-age students, 10.2 percent were African American, 6.1 percent were Latino, 5.8 percent Asian, with the comparison group (other, nearly all Caucasian), accounting for the remaining 77.9 percent. In the sub-sample of the part-time traditional-age students, 9.3 percent were African American, 7.4 were Latino, 5.0 were Asian and the remaining 78.3 percent were other (Caucasian). In the part-time sample of non-traditional-age students, 9.4 percent were African American, 5.9 Latino, 3.0 Asian and 81.7 percent were other (Caucasian). These percentages are consistent with national averages for these groups (Hippensteel et al., 1996; St. John & Starkey, 1994) and support the position which suggests that minority students were more likely to be of nontraditional age and to attend college part-time (Bean et al., 1985).

Gender. Women accounted for 55.7 percent of the full-time students and 58.3 percent of part-time students. In the sub-sample of traditional-age full-time students, 45.0 percent were male and 55.0 percent female. Among the non-traditional-age full-time students, 42.3 percent were male and 57.7 percent were female. In the sub-sample of traditional-age part-time students, 49.7 percent were male and 51.3 percent were female. Conversely, among non-traditional-age part-time students, 37.7 percent were male and 63.3 percent were female. These results indicate that a substantially higher percentage of women are enrolled in community colleges than men, and a higher percentage of women are also enrolled on a part-time basis. This is consistent with the findings of other national research that more women are attending colleges on a part-time basis due to work and family obligations (Bean et al., 1985, Paulsen, 1998).

Mother's education. In the overall full-time sample, 19.2 percent of the students had mothers with less than a high school degree, 35.6 percent had mothers with high school degrees, 24.5 percent had mothers with some college, 12.5 percent had mothers with college degrees, 5.1 percent had mothers with master's degrees, and 3.1 percent had mothers with advanced degrees.

In the overall part-time sample, 24.8 percent of the students had mothers with less than a high school degree, 37.3 percent had mothers with high school degrees, 24.1 percent had mothers with some college, 9.0 percent had mothers with a college degrees, 3.6 percent had mothers with master's degrees, and 1.2 percent had mothers with advanced degrees.

In the sub-group of traditional-age full-time students (Table 1), 13.6 percent had mothers with less than a high school degree, 35.6 percent had mothers with high school degrees, 26.7 percent had mothers with some college, 14.3 percent had mothers with college degrees, 6.1 percent had mothers with master's degrees, and 3.7 percent had mothers with advanced degrees.

In the sub-group of non-traditional-age full-time students, 35.3 percent had mothers with less than a high school degree, 35.2 percent had mothers with high school degrees, 18.3 percent had mothers with some college, 7.6 percent had mothers with college degrees, 2.3 percent had mothers with master's degree and 1.3 percent had mothers with advanced degrees.

In the sub-group of traditional-age part-time students, 11.9 percent had mothers with less than a high school degree, 38.1 percent had mothers with high school degrees, 30.9 percent had mothers with some college, 12.6 percent had mothers with college degrees, 4.8 percent had mothers with master's degrees and 1.7 percent had mothers with advanced degrees.

In the sub-group of non-traditional-age part-time students, 31.3 percent had mothers with less than a high school degree, 36.9 percent had mothers with high school degrees, 20.7 percent had mothers with some college, 7.2 percent had mothers with college degrees, 3.0 percent had mothers with a master's degree and 0.9 percent had mothers with advanced degrees.

These percentages suggest that students with mothers who have lower levels of education are more likely to attend community college on a part-time basis and at a non-traditional-age.

Age. The average age of students who attended on a full-time basis was 22 years old, and for those attending on a part-time basis, the average age was 28.4 years old.

In the sub-group of traditional age full-time students, the average age was 19.2 years old, while the average age of non-traditional-age full-time students was 30.4 years.

In the other sub-groups, for traditional age part-time students, the average age was 19 years old, and for non-traditional age part-time students, the average age was 32.6 years old.

These percentages demonstrate that, as expected, part-time and non-traditional-age students are substantially older than full-time students and those of traditional-age.

Marital status. In the overall sample, 14.2 percent of the full-time students were married, and 41.3 percent of the part-time students were married.

In the sub-group of full-time traditional-age students only 4.5 percent were married, while 41.8 percent of non-traditional-age students were married.

In the part-time sub-groups, 9.0 percent of traditional age students were married and 57.4 percent of the non-traditional age students were married. Again, these percentages indicate, as expected, that older and part-time students are more likely to be married.

High school experience. In the overall full-time sample, 5.7 percent of students held GEDs, 3.6 percent held no high school degree and 90.7 percent held a high school diploma. In the overall part-time sample, 7.9 percent held a GED certificate, 4.9 percent had no high school diploma and 87.2 percent of part-time students held a high school diploma.

In the sub-group of full-time traditional age students 1.9 percent held a GED, 3.0 percent had no high school diploma and 95.1 percent had a high school diploma. Among non-traditional-age full-time students, 16.5 percent held a GED, 5.1 percent had no high school diploma and 78.4 percent held a high school diploma.

In the part-time sub-groups, 3.5 percent of the traditional-age students held a GED, 3.3 percent had not high school diploma and 93.2 percent held a high school diploma. Among non-traditional-age part-time students, 10.2 percent held a GED, 5.8 percent had no high school diploma at all, and 84 percent held a high school diploma.

These percentages suggest that students of non-traditional-age, and, to a lesser extent, part-time students, are the most likely to have GED's and least likely to have high school diplomas.

Employment. In the overall full-time sample, 57.0 percent of the students were working, while 82.0 percent of all part-time students held a job.

In the sub-group of full-time traditional-age students, 59.3 percent were working, while 50.6 percent of full-time non-traditional-age students held employment. In the part-time sub-groups, 80.8 percent of the traditional-age students held employment, while 82.5 percent of the non-traditional age students were working.

These percentages suggest that part-time students, regardless of their age, were far more likely than full-time students to be working, suggesting that employment plays a significant role in the student's desire or need to go to school on a part-time basis.

Dependency status. In the overall full-time sample, 20.5 percent of students were independent, while 52.5 percent of the part-time students were independent.

In the sub-group of full-time traditional-age students, 4.8 percent were independent, while, among students of non-traditional age, 65.6 percent were independent.

In the part-time sub-groups, 10.0 percent of the traditional-age students were independent, while 73.7 percent of the non-traditional age students were independent. These percentages suggest, as expected, that older and part-time students are far more likely than others to be working while attending college.

Income levels. In the overall full-time sample, 23.9 percent of students had income less than $11,000, 33.5 percent had income of $11,000 to $29,999, 34.8 percent had income of $30,000 to $60,000, and 7.8 percent had income above $60,000. Among part-time students, 23.0 percent had income less than $11,000, 37.8 percent of part-time students had income of $11,000 to $29,999, 33.7 percent had income of $30,000 to $60,000, and 5.5 percent had income above $60,000.

In the full-time sub-groups, 17.0 percent of the traditional-age students had income less than $11,000, 33.1 percent had income of $11,000 to $29,999, 40.4 percent had income of $30,000 to $60,000 and 9.5 percent had income above $60,000. Among students in the non-traditional-age full-time group, 43.5 percent had income below $11,000, 34.5

percent had income of $11,000 to $29,999, 18.9 percent had income of $30,000 to $60,000, and 3.1 percent had income above $60,000.

In the part-time sub-groups, among the traditional -age students, 20.2 percent had income less than $11,000, 32.1 percent had income of $11,000 to $29,999, 39.6 percent had income of $30,000 to $60,000 and 8.1 percent had income above $60,000. Among non-traditional-age students, 24.5 percent had income of less than $11,000, 40.5 percent had income of $11,000 to $29,999, 30.8 percent had income of $30,000 to $60,000 and 4.2 percent had income above $60,000.

These percentages are consistent with previous research indicating that low-income and lower-middle-income students are over-represented at community colleges (McPherson & Schapiro, 1998), a pattern that is intensified among students of non-traditional-age and those attending part-time. These results support the view that, indeed community colleges are access institutions of critical importance in American higher education, and represent a key area for the development and targeting of aid programs that can promote access for students with the greatest financial need.

College choice. Fixed Costs: In the overall full-time sample, 17.8 percent of students stated that they chose their college because of the financial aid they were offered; 26.0 percent of full-time students stated that they chose their college because of the low tuition cost while 19.7 percent of them stated that they chose their college of choice because of both low tuition and financial aid they were offered.

Controllable costs: In the overall full-time sample, 15.2 percent stated that they chose their college because of low living costs, 22.7 percent stated that they chose their college so they could work while attending, and 17.4 percent stated that they chose their college both because of low living cost and because they could work while attending.

Fixed Costs: In the overall part-time sample, 7.2 percent stated that they chose their college because of financial aid offered; 34.5 percent stated that they made their choice because of low tuition cost, and 10.7 percent indicated that they chose their college because of both low tuition and financial aid offered.

Controllable Costs: Among part-time students, 5.2 percent stated that they chose their college because of low living costs. 52.9 percent stated that they chose to attend their college of choice because they could work, while 18.7 percent indicated that they chose their college both because of low living costs and because they could work while attending.

Fixed Costs: In the sub-group of full-time traditional-age students, 16.4 percent stated that they chose their college because of the financial aid they were offered; 26.6 percent stated that they chose their college because of low tuition, while 19.0 percent stated that they chose their college because of both low tuition and financial aid offered.

Controllable costs: In the sub-group of full-time traditional age students, 15.5 percent stated that they chose their college because of low living costs, 20.3 percent stated they chose their college because they could work, while 18.6 percent stated that both low living costs and could work were very important reasons for their choice of college.

Fixed Costs: In the sub-group of full-time non-traditional age students, 21.7 percent stated that they chose their college because of the financial aid they were offered; 23.9 percent stated that the made their choice because of low tuition cost, while 21.6 percent stated that both low tuition and financial aid offered were very important reasons for their choice of college.

Controllable Costs: In the sample of full-time non-traditional-age students, 14.2 percent stated that they chose their college because of low living costs, 29.5 percent indicated that they chose their college because they could work, while 14.0 percent stated that both living costs and being able to work were very important reasons for their choice of college.

Fixed Costs: In the sub-group of part-time traditional-age students, 7.1 percent stated that they chose their college because of the financial aid they were offered, 40.2 percent stated that low tuition was the reason for their choice, and 10.7 percent of traditional part-time students stated that they made their choice because of both low tuition and the financial aid they were offered.

Controllable Costs: Among part-time traditional-age students, 7.8 percent stated that they made their choice of college because of low living costs, 43.4 percent indicated that they chose their college because they could work, while 25.2 percent stated both low living costs and could work were very important reasons for their choice.

Fixed Costs: In the sub-group of part-time non-traditional-age community college students, 7.3 percent stated that they chose their college because of the financial aid that was offered, 31.7 percent stated that they made their choice because of low tuition, and 10.8 percent chose their college because of both low tuition and the financial aid offered.

Controllable cost: In the sample of part-time non-traditional-age students, 3.9 percent stated that they chose their college because of low living costs, 57.6 percent of the students stated that they chose their college because they could work, while 15.5 percent stated that both low living costs and could work were very important reasons for their college choice.

In summary, these percentage indicate the high levels of cost-consciousness of full-time and part-time, as well as traditional-age and non-traditional-age, students. All groups are clearly concerned about financial factors in their choice of college. This high level of cost-consciousness is precisely the pattern of responsiveness to financial factors one would expect to find for students who elect to attend community colleges--America's lowest-cost and most accessible institutions of higher education. These findings have implications for policy which are discussed in chapter five.

College experience. The college experience variables include number of years in college and college grades.

Years in College. In the overall full-time sample, 58.4 percent of the community college students were freshman, while 55.5 percent of the part-time students were freshman. In the sub-group of traditional-age full-time students, 59.9 percent were freshman, and 53.9 percent of the full-time non-traditional-age students were freshman.

In the part-time sub-groups, 59.5 percent of the traditional-age students and 53.4 percent of the non-traditional-age students were freshman.

Grades. In the overall sample of full-time students, 7.8 percent had grade point averages that were below a "C" average, 24.0 percent had grades of mostly "C" averages, 23.7 percent had "B" averages, and 3.9 percent had "A" averages.

In the part-time sample, 7.5 percent had grade point averages that were less than a "C" average, 21.8 percent had grades of mostly "C" averages, 27.1 percent had "B" averages, and 8.7 percent had "A" averages.

In the sub-group of full-time traditional-age students, 9.3 percent had grade point averages that were below "C" averages, 25.3 percent had grades of mostly "C" averages, 20.7 percent had "B" averages, and 1.8 percent had "A" averages.

In the sub-group of full-time non-traditional-age students, 3.5 percent had grade point averages that were below "C" averages, 20.1 percent had grades of mostly "C" averages, 32.2 percent had "B" averages, and 6.1 percent had "A" averages.

In the sub-group of part-time traditional-age students, 12.6 percent had grade point averages that were below "C" averages, 26.8 percent had grades of mostly "C" averages, 15.3 percent had "B" averages, and 3.3 percent had "A" averages.

In the sub-group of part-time non-traditional-age students, 5.0 percent had grade point averages that were below "C" averages, 19.4 percent had grades of mostly "C" averages, 32.7 percent had "B" averages, and 11.5 percent had "A" averages.

An interesting pattern emerges with respect to the grades received by students in the different sub-samples. A noteworthy finding is that the two sub-samples whose students most often have grades below "C" and grades of "C" are the students of traditional age, and that goes for both full-time and part-time students. There may well be a maturation effect at work here in terms of the greater seriousness with which older students-whether part-time or full-time-approach their academic work at community colleges. This pattern is reinforced by the further observation that there do not appear to be substantial differences in the percentages of students receiving below "C" or "C" grades between the overall full- and part-time student samples.

Aspirations. The factors for aspirations contain specific questions that relate to the student's desired level of postsecondary educational attainment, using five different levels: 8.0 percent of the students in the overall full-time sample aspired to attain a vocational degree, 25.1 percent aspired some college, 40.5 percent aspired to attain a college degree, 19.3 percent responded that they aspired to attain a master's degree, and 7.1 percent aspired to attain an advanced degree.

In the overall part-time sample, 7.9 percent of the students aspired to attain a vocational degree, 34.1 percent aspired to attain some college, 40.5 percent aspired to attain a college degree, while 13.5 percent aspired to attain a master's degree and 4.0 percent aspired to attain an advanced degree.

In the sub-group of full-time traditional-age students, 6.6 percent responded that they aspired to attain a vocational degree, 22.7 percent aspired to attain some college, 42.3 percent aspired to attain a college degree, 20.8 percent aspired to attain a master's degree, while 7.6 percent aspired to attain an advanced degree.

In the sub-group of full-time non-traditional-age students, 12.2 percent of the students aspired to attain a vocational degree, 31.8 percent aspired to attain some college, 35.4 percent aspired to attain a college degree, 14.8 percent aspired to attain a master's degree, while 5.8 percent aspired to attain an advanced degree.

In the sub-group of part-time traditional-age students, 8.1 percent aspired to attain a vocational degree, 27.6 aspired to have some college, 40.9 percent aspired to a college degree, 16.8 percent aspired to attain a master's degree, and 6.6 percent aspired to attain an advanced degree.

In the sub-group of part-time non-traditional-age students, 7.8 percent of the students responded that they aspired to a vocational degree, 37.3 percent of the students aspired to attain some college, 40.2 percent of the students aspired to have a college degree, 11.9 percent aspired to have a master's degree, and 2.8 percent aspired to have an advanced degree.

The differences in these percentages suggest that part-time and non-traditional-age students reported lower levels of educational aspirations, compared to full-time and traditional-age students.

Financial Variables. These variables are five in number and continuous in nature. Four of these variables are fixed costs, consisting of grant amount, loan amount, work-study amount, and tuition price; and the fifth is a controllable cost variable, food and housing amount.

In the overall sample of full-time students, the average grant amount was $1,025, the average loan amount was $651, the average work-study amount was $57, the average annual tuition paid was $1,621, while the average cost for food and housing was $1,060.

In the overall sample of part-time students, the average grant amount was $225, the average loan amount was $139, the average work-study amount was $7.00, the average annual tuition paid was $362, while the average cost for food and housing was $341.

In the sub-group of full-time traditional students, the average grant amount was $994, the average loan amount was $628, the average work-study amount was $54, and the average annual tuition paid was $1,744, while the average food and housing cost was $1,175.

In the sub-group of full-time non-traditional-age students, the average grant amount was $1,115, the average loan amount was $715, the average work-study amount was $63, and the average annual tuition paid was $1,265, while the average food and housing cost was $727.

In the sub-group of part-time traditional-age students, the average grant amount was $236, the average loan amount was $127, the average work-study amount was $9, and the average annual tuition paid was $381, while the average food and housing cost was $387.

In the sub-group of part-time non-traditional-age students, the average grant amount was $219, the average loan amount was $144, the average work-study amount was $6, and the annual average tuition paid was $353, while the average food and housing cost was $317.

For all samples, the overall average amounts of financial aid appear to be insufficient relative to the overall average amounts of tuition, food and housing costs. For example, for both full-time and part-time students, grants cover about 62 to 63 percent of tuition costs. One exception to this occurs in the sample of full-time students of non-traditional-age, who have a grant-to-tuition ratio of 88 percent. This may be due to the fact that larger percentages of non-traditional-age students are declared financially independent, and therefore, are more often eligible for need-based grant aid. As expected, the amounts of aid received and tuition and costs paid by the part-time students, of both traditional and non-traditional-age are much less than those for full-time students. These differences are quite consistent with the differences in eligibility for aid, the lower tuition costs associated with part-time attendance, and the greater opportunities part-time students have to manage their living costs.

Descriptive Statistics Summary

In summation, ethnicity variable percentages are consistent with national averages and support the position that suggests that minority students were more likely to attend college part-time (Bean et al., 1985; Hippensteel et al., 1996; St. John & Starkey, 1994).

Gender variables indicate that a substantially higher percentage of women are enrolled in community colleges than men, and a higher percentage of women are also enrolled on a part-time basis. This is consistent with the findings of other national research that more women are attending colleges on a part-time basis due to work and family obligations (Bean et al., 1985; Paulsen, 1998).

Mother's education variable percentages suggest that students with mothers who have lower levels of education are more likely to attend community college on a part-time basis and at a non-traditional-age.

Age variable percentages demonstrate that both part-time and non-traditional-age students are substantially older than full-time students and those of traditional age.

Marital status variable percentages indicate that older and part-time students are more likely to be married.

High school experience percentages suggests that students of non-traditional-age, and to a lesser extent, part-time students, are the most likely to have GED's and least likely to have high school diplomas.

Employment variables suggests that part-time students regardless of their age, were far more likely than full-time students to be working, suggesting that employment plays a significant role in the student's desire or need to go to school on a part-time basis.

Dependency status percentages indicate that older and part-time students are far more likely than others to be working while attending college.

Income level variables support the view that, indeed, community colleges are access institution of critical importance in American higher education, and represent a key area for the development and targeting of aid programs that can promote access for students with the greatest financial need.

College choice variables indicate the high levels of cost-consciousness of full-time and part-time, as well as traditional-age and non-traditional-age students. All groups are clearly concerned about financial factors in their choice of college. This high level of cost-consciousness is precisely the pattern of responsiveness to financial factors one would expect to find for students who elect to attend community colleges--America's lowest-cost and most accessible institutions of higher education.

An interesting pattern regarding students' grades is that the two sub-samples whose students most often have grades below "C" and grades of "C" are the students of traditional age, and that goes for both full-time and part-time students. There may well be a maturation effect at work here in terms of the greater seriousness with which older students-whether part-time or full-time-approach their academic work at community colleges.

Aspiration variables indicate differences in percentages which suggest that part-time and non-traditional-age students have lower levels of educational aspirations, compared to full-time and traditional age students.

Financial variables for all samples indicate that the average amounts of financial aid appear to be insufficient relative to the overall average amounts of tuition, food and housing costs. Grants only cover 62 to 63 percent of tuition costs for both full-time and part-time students and the amounts of aid received and tuition and costs paid by the part-time students, of both traditional and non-traditional-age, are much less than those for full-time students. These differences are quite consistent with the differences in eligibility for aid, the lower tuition costs associated with part-time attendance, and the greater opportunities part-time students have to manage their living costs.

Logistic Regression Analysis

As was discussed in the methodology section in Chapter 3 of this study, sequential logistic regressions were used in this study to examine the effects of various factors on student college-choice and persistence decisions. With special emphasis on the financial nexus between college choice and persistence, this study examined the effects of five sets of factors on the persistence decisions of community college students: background, college choice, college experiences, aspirations and financial variables.

In the sequential logistic analysis (Tables 2 - 4), variables related to these factors were added in a two-step sequence. The first step includes the background, college-choice, college experience, and aspiration variables which constitute the initial model. The addition of the second set of variables--the financial variables--in the second step, which constitutes the financial model, increased the model's goodness-of-fit and increased its effectiveness in predicting persistence. The Somer's D and pseudo-R squared increased from step one to step two, as the -2 log L decreased, all of which indicate an improved goodness-of-fit and increased capacity to predict persistence. In this section, the results of each step are presented separately, allowing for the assessment of changes in goodness-of-fit as a result of adding the financial variables (in step two), as well as an examination of the interactions between the financial variables and other sets of variables entered in the first step of the analysis.

The model was estimated in two steps for each of five samples examined in this part of the study: all full-time students, all part-time students; full-time students of traditional-age, full-time students of non-traditional-age; and part-time students of non-traditional age. The sample size was not adequate to estimate the model for part-time students of traditional-age. Even though the size of this sub-sample was 579, the cross tabulations of design sets of dichotomous independent variables, combined with a dichotomous dependent variable, produced zero cell sizes that did not permit maximum likelihood estimation.

Table 2 shows the results for the overall samples of full-time and part-time students. Table 3 shows the results for the sub-groups of full-time students of traditional and non-traditional age, and Table 4 shows the results for part-time students of non-traditional age. The first column of numbers presents the Delta P statistics for the initial (step 1) model of persistence, including all variables measuring aspects of student background, college choice, college experiences, and aspirations. The second column of numbers shows the Delta P's for the final model (step 2) of persistence, where the five types of financial variables -- grant amounts, loan amounts, work amounts, tuition amounts, food and housing amounts -- are added to the variables that were already present in step one. Next to each Delta P that is significant at either the .01, .05, or .1 level, the appropriate number of asterisks are shown, according to the legend shown below the line at the bottom of the table.

Overall model statistics are also presented, including the Baseline P, Somer's D, Model N, Pseudo R squared, -2 log likelihood, for each steps of each estimated model.

Results for the Overall Full- and Part-Time Samples of Community College Students

In Table 2, the results of two steps are presented for the model estimated for each sub-sample--full-time students and part-time students. The baseline P shows that the percentage of those persisting in the full-time sub-sample is 90.5 percent and 72.7 percent in the part-time sub-sample. Step 1 contains the estimated Delta P's for all variables except the financial variables that are added in step 2. As mentioned earlier, this pattern holds for all sub-samples and sub-groups. The -2 log likelihood decreased substantially from step 1 to step 2 across the two sub-samples, full-time and part-time students, indicating that the financial model (step 2) is a better model for both sub-samples. The goodness-of fit measure, Somer's D, increased from step 1 to step 2 in the full-time sub-sample by a gain of 0.134 (from 0.345 to 0.479) and by a gain of 0.189 in the part-time sub-sample (from 0.272 to 0.451). Pseudo R squared also increased substantially from 0.0887 to 0.1894, a gain

Table 2

Logistic Analysis of The Financial Nexus Between College Choice and Persistence for Full- and Part-time Community College Students

Factor/Variable	Step 1 Delta P Full-Time	Step 2 Delta P Full-time	Step 1 Delta P Part-time	Step 2 Delta p Part-time
Background:				
Ethnicity				
African Amer.	0.01591**	-0.00349	0.08393**	0.08129**
Latino	0.00801	-0.04692*	0.06984*	0.01015
Asian	-0.12268	-0.18809***	-0.19184**	-0.26808***
Gender				
Male	-0.01163	-0.00369	0.00524	0.02421
M. Education				
Less than H.S.	0.03235**	0.03371**	-0.10000***	-0.11540***
some college	0.00329	0.00129	-0.00349	-0.03157
college	0.04393***	0.03920**	0.02927	0.00010
master's	0.03727	0.03720	0.02083	-0.02450
advanced	0.06747***	0.06513**	0.00171	-0.01780
Age	0.00148	0.00008	0.00066	-0.00081
Married	0.00735*	-0.00357	0.02912	0.01785
H.S. Exp.:				
GED	0.03399**	0.04423***	0.05326	0.06931*
No H.S. Dip.	0.04420**	0.04064**	0.04947	0.02895
Employment:				
working	0.03499**	0.02968**	0.07065**	0.02911
Dependency:				
independent	0.01259	0.03023*	0.01943	0.02295
Income Levels:				
lower	0.01233	0.02182	-0.00453	0.00792
up-middle	0.00951	-0.00543	-0.02557	-0.02480
upper	-0.02471	-0.04465	0.08493**	0.07249
Collg. Choice:				
Fixed Costs				
fin. Aid	-0.02516	0.02953	0.01661	0.08777*
Low tuition	0.00558	-0.01041	-0.02495	-0.00348
Tuit. & Aid	-0.03469	-0.00226	0.04486	0.09693**
Cont. Costs				
Living Cost	0.03670**	0.04129**	-0.04576	0.00618
could work	0.03504***	0.02168	0.00245	0.00508
Liv. C & Work	-0.00781	-0.00796	0.01619	0.02738

Table 2 Continued

Factor/Variable	Step 1 Delta P Full-Time	Step 2 Delta P Full-Time	Step 1 Delta P Part-Time	Step 2 Delta P Part-Time
College Exp.				
Years in Col.				
Freshman	0.00738	0.00704	0.05645**	0.04569*
Grades				
< C	0.06709***	0.06682***	0.13343***	0.13930***
mostly C	0.05288**	0.03473**	0.08675***	0.08831***
mostly A	0.03220	0.03418	0.07961**	0.07582*
not reptd.	0.05741***	0.05208***	0.12447***	0.12120***
Aspirations:				
voc.	0.04762***	0.04476***	0.06714	0.05553
some collg.	0.03416***	0.04057***	0.00960	-0.00023
master's	-0.00547	-0.00166	-0.03640	-0.03389
advanced	-0.05365	-0.04640	-0.09357	-0.12071
Financial:				
Fixed Costs				
grants $		-0.04083***		-0.04747
loan $		-0.00748		-0.03977
work $		-0.10125		-0.13339
tuition $		-0.29511***		-0.68553***
Cont. Costs				
Food/housing $		-0.05803***		-0.09468***
Base line P	0.9051	0.9051	0.7270	0.7270
Somer's D	0.345	0.479	0.272	0.451
Model N	2351	2351	1740	1740
Pseudo R^2	0.0887	0.1894	0.0495	0.1326
-2 Log	1506.913	1340.411	1963.023	1791.434
Df	33	38	33	38

* = 0.10 level of significance.
** = 0.05 level of significance.
*** = 0.01 level of significance.

of 0.1007 in the full-time sub-sample and from 0.0495 to 0.1326, a gain of 0.0831 for the part-time sub-sample. Each of these findings verifies that the addition of the financial variables in step 2 increases the model's goodness-of-fit for both sub-samples (Hippensteel et. al ., 1996; St. John, Paulsen & Starkey, 1996; St. John & Starkey, 1994).

Social Background. The influence of seventeen variables related to students' social, economic, and educational background were considered. Each of these background variable's level of significance in step 1 and step 2 for the full-time and step 1 and step 2 for the part-time sub-samples, will be presented. First, African Americans were significantly more likely than other groups to persist in step 1 for both the full- and part-time sub-samples. Being African American was also significant in step 2 for the part-time sub-sample. This is consistent with previous research on community college students (Hippensteel, et al., 1996; St. John & Starkey, 1994).

Since 1980, tuition and aid policies have led an increasing proportion of African American and low-income students to attend community colleges (McPherson & Schaprio, 1998; St. John & Starkey, 1994). Because the inequity of such policies has increased the attendance of Blacks at community colleges, the finding of this study that Blacks are more likely than other students to persist at such college is especially important. Among part-time students, African Americans' higher likelihood of persistence does not even appear to interact with the amounts of costs and aid available. Among full-time students, however, African Americans are more likely to persist only in step 1; and this positive effect disappears once financial variables are controlled for in step 2. This suggests that African American students attending full-time may have been more successful at managing their living costs, more likely to attend colleges with lower tuition, or received high aid packages than other groups. The most noteworthy finding here is that African Americans, more than any other group, have found ways to be successful and persistent through part-time attendance. However, after financial variables are added in step 2, African American students who attend full-time are no more likely to persist than Caucasians.

Being Latino was only marginally significant and negative at the .10 level for step 2 of the full-time sub-sample and positive and significant at the same marginal level of significance in step 1 of the part-time sub-sample. Both full-time and part-time Latino students became less likely to persist once financial variables were controlled in step 2 indicating that Latinos may have been more likely than those in the base group (Caucasian) to experience lower living costs, pay less tuition or receive more aid. Asians were less likely to persist in step 2 of the full-time sample and in steps 1 and 2 for the part-time sub-sample. The magnitude of the negative effects were large and became even larger when financial variables were controlled in step 2 for both samples. Apparently, costs, net of aid was more problematic for Asians, thereby reducing their access to community colleges.

Second, students with mothers with less than a high school degree were significantly more likely to persist than students whose mothers had high school diplomas in both step 1 and step 2 of the full-time sub-sample and were significantly less likely to persist in both step 1 and step 2 of the part-time sub-sample. This may mean that full-time students whose mothers had less than a high school education did not desire to be like their mothers, struggling from one minimum wage job to the other, and continually seeking ways to remain on welfare, due to lack of good paying jobs for those with limited education. Then students may well have been more aware of the constraints and limited option due to a lack of education. Therefore, their likelihood of taking advantage of opportunities for education that could allow them to expand their own life options would be greater. However, those students who attended on a part-time basis were less likely to persist, because they had many other life challenges and responsibilities, so that it was not possible for them to maintain college attendance as a high priority.

Students whose mothers had a college degree or advanced degree were significantly more likely to persist than students whose mothers had only a high school education. These students may be more likely to persist because they are more highly motivated, desire to achieve a status similar to, or better than their mothers, have been exposed to a high value placed on education and what education can do for an individual. In other words, these students may have been exposed to different cultural capital and habitus than those without educated mothers.

Third, being married was marginally significant and positive only in step 1 of the full-time sub-sample, at the level of .10, but became neutral when financial variables were added in step 2. This shows that being married interacted with financial variables in the model. It may be that married students were more effective than others at managing their living costs when attending full-time.

Fourth, students having a GED and those with no high school diploma were significantly more likely than high school graduates to persist in both steps 1 and 2 for the full-time sub-sample. Apparently, students who had previously had unsuccessful experiences in high school, but were also motivated to overcome such experiences to the degree that they attended college full-time, were more likely to persist than those who had not had to face and overcome such difficult circumstances. This interpretation is reinforced by the finding that this motivational pattern was not prevalent among students attending part-time. For students attending part-time, those with and without high school diplomas were equally likely to persist, and having a GED was significant and positive only in step 2, indicating that costs, net of aid, may have been problematic for such students.

Fifth, having employment was significant and positive in step 1 and step 2 of the full-time sub-samples and significant and positive in step 1 of the part-time sub-sample. Working students who were also committed to full-time attendance were apparently more motivated to persist in their studies than unemployed full-time students. For part-time students, being employed interacted with the financial variables entered in step 2. Apparently, working helped part-time students to cover the costs of college attendance.

Sixth, being independent was positive and significant only in step 2 of the full-time sample at the .10 level of significance, achieving significance only after the financial variables were stepped-in. Costs, net of aid were apparently problematic for such students, perhaps because the Pell grant formula results in smaller awards for independent than dependent students in cases with similar need.

Seventh, being from an upper-income level was only positive and significant in step 1 of the part-time sample at the .05 level of significance. This may be because upper-income students were less averse to loans and may have taken out more loans than the lower-income students, while lower-income students are more averse to loans and less likely to take out loans.

College Choice. First, choosing a college because of the financial aid available or because of the availability of both aid and low tuition, were positive and significant only in step 2 of the part-time sub-sample. The effect of choosing a college because of financial aid and because of both aid and low tuition became significant and positive only after the financial variables were added in step 2 for the part-time group. This indicates an interaction between these college-choice variables and the financial variables. Apparently, for part-time students, who chose their colleges because of available aid and low tuition, the amount of aid received relative to tuition charges and other costs of attendance was inadequate. This also suggests that the implied contract between the student and the college made at the time of enrollment, may not have been fulfilled because the amount of aid available was not sufficient to adequately cover the tuition and living costs to which part-time students were highly sensitive.

Choosing a college because of low living costs was significant in step 1 and step 2, which included the financial variables, for the full-time sub-sample. Students who chose to attend a community college because it enabled them to better manage their living costs were probably geographically limited, and were likely to be adults with a variety of responsibilities or younger students who lived with parents at home. This supports the notion that the community college is a neighborhood college serving the population within a relatively well defined local area.

Choosing a college because the students could work was positive and significant only in step 1 of the full-time sub-sample. Choosing to attend a college because one could work had a significant and positive association with persistence only in the initial model, indicating an interaction between this choice variable and financial variables added in step 2. This suggests that students who chose their college because they were able to work were more likely to persist because either their earnings from their jobs increased their ability to pay the costs of attending or working students may have chosen colleges that had lower tuition. More than half (57 percent) of the students enrolled full-time at the community colleges worked and 87.2

percent of the part-time sub-sample worked (Table 1), indicating that being able to work was very important in the choice of a college for these students. This suggests that most of the students who worked were able to afford to continue their enrollment because they were working.

College Experience. In this group, the influence of five variables related to students' years in college and grades were considered. First, being freshman was positive and significant in step 1 and step 2 of the part-time sub-sample. This finding is quite consistent with previous research on community college students (Hippensteel et al., 1996; St. John & Starkey, 1994).

Second, college grades has a curvelinear relationship with persistence for both samples. Students with grades of "C" or less than "C" were significantly more likely to persist than those with "B" grades in step 1 and step 2 in both sub-samples of full- and part-time students. In step 1 and step 2, the Delta P ranged from 6.7 to 6.6 in the full-time sub-group and in the part-time sub-sample, the Delta P ranged from 13.3 to 13.9. These results are generally consistent with previous research (Hippensteel, et al., 1996; St. John & Starkey, 1994). There are at least two plausible explanations for this finding. First, students with lower grades were probably more likely to persist because of common college policies that make it difficult for students to re-enroll or return to college if they drop out with low grades or poor academic standing. Second, students with B grades (the base group) were more likely to have a wider range of exit options. For example, students with B grades were probably more likely to transfer to four-year institutions or stop-out, and therefore, would have been less likely to persist.

The additional finding that part-time students with "A" grades are more likely to persist than those with "B" grades is inconsistent with previous research. However, it is a meaningful finding that seems readily interpretable. Students with the highest grades may be experiencing the greatest amount of academic integration, satisfaction and even special attention from their instructors. Such effects would appear to be even more important for part-time than for full-time students.

Aspirations. Four variables related to students' aspirations were examined. Only two of the variables were significant, and they were significant for full-time students only. Students who aspired to attain a vocational degree or some college were significantly more likely to persist than students who sought a college degree. These findings are consistent with other persistence studies using NPSAS:87. It appears that students with shorter-term goals were more likely to persist, perhaps because their goals were more immediate, while students who had longer-term aspirations were more likely to drop out either due to financial reasons or in preparation for transfer to an institution where they could reach their level of aspiration (St. John et al., 1992).

Financial Variables. The addition of the student aid and tuition variables (fixed costs) in step 2 significantly improved the goodness-of-fit of the models, as well as the model's ability to predict persistence. This is indicated by the increases in the pseudo R squared from 9 percent to 18.9 percent in the full-time sub-sample; and in the part-time sub-sample, pseudo R squared increased from 5 percent to 13.2 percent. In similar fashion, the Somer's D increased from 34.5 percent to 47.9 percent in the full-time sub-sample, and from 27.2 percent to 45.1 percent in the part-time sub-sample. Finally, the reduction in the -2 Log L was substantial between steps 1 and 2.

Financial variables had substantial direct effects on persistence. Grant amount was negative and significant for the full-time sub-sample, indicating that grant amounts were inadequate to meet the costs of attending. This supports the argument that a combination of government policies--the decline in Pell grants (Lewis, 1989), the rising costs of tuition (St. John, 1992), and the failure of states to invest in grants through taxation (Hearn & Longanecker, 1985)--worked together to limit the capacity of community colleges to fulfill their purpose of serving as an open "access" institution.

Tuition was negative and significant in both the full-time sub-sample and the part-time sub-sample; however, the magnitude of the tuition-responsiveness of full-time and part-time students differs substantially. For full-time students, each $1,000 differential in tuition decreased the probability that the otherwise average student would persist by about 29.5 percent. This is consistent with the tuition-responsiveness observed in other studies of community college students (Hippensteel et al., 1996; Rouse, 1994; St. John & Starkey, 1994). However, this is the first study to examine the tuition-sensitivity of community college students separately for full- and part-time student samples. Results indicate that for part-time students each $1,000 differential in tuition decreased the probability of persistence by 68.6 percent. This finding is quite understandable, in terms of the characteristics of part-time students reported in Table 1. Part-time students, compared to full-time students, consist of more minority, low-income, and older students, all of whom have been shown to be much more tuition-sensitive than other groups (Heller, 1997; Leslie & Brinkman, 1988; St. John & Starkey, 1994, 1995).

The controllable costs of food and housing were significant and negative for both full- and part-time sub-samples. Delta P values ranged from 5.8 percent for full-time to 9.5 percent for part-time students. Students' responsiveness to these costs are not as high as for tuition. This is probably because community college students have more control over how much food they can budget and pay for and how much rent they can afford to pay. They could adjust these amounts by having a roommate or two, and could reduce the number of times they eat out and how much they spend on entertainment, when compared to fixed cost variables such as tuition, over which they have no control.

In summary, inadequate grants, relative to the levels of tuition and living costs are clearly problematic for full-time students and reduce access to higher education at community colleges. However, a much higher tuition-sensitivity and a substantial responsiveness to living costs pose serious barriers to access for part-time students attending community colleges.

Results for Full-Time Traditional-Age and Full-Time Non-Traditional-Age Sub-Samples

In Table 3, results for two models are presented separately one for each sub-sample--traditional-age and non-traditional-age--of all full-time community college students. For each sub-sample's results, the first column of numbers presents the Delta P statistics for the initial (step 1) model of persistence measuring aspects of student background, college choice, college experiences, and aspirations. The second column of numbers shows the Delta p's for the financial model (step 2) of persistence, where financial variables--grants amounts, loan amounts, work amounts, tuition amounts, food and housing amounts--have been added. Next to each numeric result that is significant

Table 3

Logistic Analysis: Traditional-Age and Non-Traditional-Age Full-Time Community College Students

Factor/Variable	Step 1 Delta P Trad. FT	Step 2 Delta P Trad. FT	Step 1 Delta P N-Trad. FT	Step 2 Delta P N-Trad. FT
Background:				
Ethnicity				
African Amer.	0.01460	-0.00988	0.03121	0.00097
Latino	0.03996**	0.00321	-0.12898**	0.22537***
Asian	-0.06090	-0.08545	-0.24089**	-0.42130***
Gender				
Male	-0.03672**	-0.03511**	0.01959	0.02922
M. Education				
less than H.S.	0.00369	0.00259	0.04407**	0.04456**
some college	-0.00742	-0.02066	0.02468	0.06677***
college	0.02254	0.00438	0.06174***	0.06677***
master's	0.03850*	0.03906*	-0.48782	-0.40797
advanced	0.06017***	0.06034***	-0.10849	-0.20218
Age	0.00675	0.00943	-0.00027	-0.00126
Married	-0.01226	-0.01609	0.02653	0.01243***
H.S. Exp.:				
GED	0.06366***	0.06554***	-0.00375	0.01445
No H.S Dip	0.03533	0.04021	0.04567*	0.04088
Employment:				
working	0.04995***	0.04530***	-0.02051	-0.03593*
Dependency:				
independent	-0.03667	-0.04867	0.02827	0.04964***
Income Levels:				
lower	-0.01102	0.00260	0.04046**	0.04991**
up-middle	0.00610	-0.00722	-0.00125	-0.02636
upper	-0.02766	-0.04457	-0.02298	0.01235
College Choice:				
Fixed Costs				
Fin. Aid	-0.08540**	0.00118	-0.00320	0.04021
Low. Tuition	-0.01168	-0.03766	-0.00221	-0.00192
Tuit. & Aid	-0.04534	-0.02862	-0.07007	0.00931
Cont. Costs				
Living costs	0.04918***	0.05043***	0.01844	0.02211
Could Work	0.02248	0.00879	0.05315***	0.04259
Liv. C & Work	0.00809	0.01433	-0.04023	-0.05002

Table 3 Continued

Factor/Variable	Step 1 Delta P Trad. FT	Step2 Delta P Trad. FT	Step 1 Delta P N-Trad. FT	Step 2 Delta P N-Trad. FT
College Exp.:				
Years in Col.				
Freshman	0.00059	0.00026	0.03148*	0.03806**
Grades				
< C	0.06122***	0.06203***	0.05140	0.05326
mostly C	0.00399	0.00678	0.05194**	0.05089**
mostly A	0.01753	0.02510	0.00813	0.01095
not reported	0.05445***	0.05253***	0.03914*	0.02997
Aspirations:				
voc.	0.05514***	0.05710***	-0.02007	-0.03947
some collg.	0.04152***	0.04639***	-0.00157	0.01273
master's	0.00928	0.00825	-0.09445	-0.06765
advanced	-0.01659	-0.01314	-0.35327**	-0.31589*
Financial:				
Fixed Costs				
grants $		-0.03490*		-0.04975**
loan $		0.01952**		-0.05603**
work $		-0.25641		-0.02962
tuition		-0.26591***		-0.32797***
Cont. Costs				
food/housing		-0.17956***		-0.01921
Base Line P	0.9174	0.9174	0.8698	0.8698
Somer's D	0.354	0.527	0.436	0.506
Model N	1744	1744	607	607
Pseudo R^2	0.1219	0.2357	0.1576	0.2779
-2 Log	1003.486	873.437	404.473	346.71
Df	33	38	33	38

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* = 0.10 level of significance.

** = 0.05 level of significance.

*** = 0.01 level of significance.

at either the .01, .05, or .10 level, the appropriate number of asterisks are shown, according to the legend shown below the bottom line of Table 3.

Overall goodness-of-fit statistics are also presented, including Somer's D, Pseudo R squared, and -2 log likelihood for each step and sub-sample. The -2 Log likelihood decreased substantially from step 1 to step 2 for each sub-group, indicating that the final model--including financial variables--is a better fitting model. The goodness-of-fit measure, Somers' D, increased from step 1 to step 2 by a gain of 0.173 (from 0.354 to 0.527) in the sub-group of full-time traditional-age students and by a gain of 0.07 (from 0.436 to 0.506) in the sub-group of full-time non-traditional-age students. The pseudo R squared increased substantially from 0.1219 to 0.2357 (a gain of 0.1138) in the sub-group of the full-time traditional-age students, while the pseudo R squared for the full-time non-traditional-age student sub-group increased substantially from 0.1576 to 0.2779 (a gain of 0.12014).

The baseline P (percentage of those persisting in the sample) is 91.7 percent in the sub-group of full-time traditional-age students and is 86.9 percent in the sub-group of full-time non-traditional-age students. Also, note that "***" represents a significance level of .01, while "**" corresponds to .05 and "*" represents a modest association at the level of .10, in Table 3.

Student Background. The influence of seventeen variables related to students' social, economic, and educational background were considered. In the full-time traditional-age student sub-group, only six of these background variables were significant, and others became significant only when financial variables were entered. In the full-time non-traditional-age student sub-groups, six of these background variables (different from the background variables significant in the full-time traditional age sub-group) were significant, and others became significant only when financial variables were entered.

First, in the full-time traditional-age model, being Latino was positive and significant only in step 1, indicating that Latinos, when compared with Caucasians, were more likely to persist. This effect was absent after financial variables were entered in step 2, indicating an interaction between being Latino and the financial variables. Apparently, Latinos, when compared to Caucasian, chose to attend colleges with lower tuition, received larger aid awards, or had lower living costs.

Second, among non-traditional-age full-time students, Latino and Asians were significantly less likely than Caucasians to persist in both steps 1 and 2. When financial variables were entered in step 2, the magnitude of these negative differences increases substantially for both Latinos and Asians. This indicates some interaction between being Asian or Latino and the financial variables. This suggests that older Latino and Asian students may have had less difficulty handling their living expenses, or their expenses were lower than the otherwise-average student at community colleges. Nevertheless, in spite of this favorable interaction, the community college setting is clearly not providing the sorts of satisfactory experiences that are necessary to promote persistence for older Latino and Asian students. One possible explanation for this disturbing finding is that these older students face additional barriers to access related to differences in language, culture, and habitus (Bourdieu, 1977; McDonough, 1997; Paulsen & St. John, forthcoming).

Third, being a male was negative and significant only in the full-time traditional age sub-group in both step 1 and step 2. Perhaps youthful males were less likely to persist than females because they were less committed to their academic goals, and by both choice or circumstance, were less willing to make the sacrifices necessary to meet the challenges of structured college life. This finding clearly merits further investigation. It is also an especially important finding--that is, that young women are more likely than young men to persist--in light of the substantial increases in the participation rates of women over the past fifteen years.

Fourth, students whose mothers had less than a high school education were significantly more likely to persist than those whose mothers had a high school diploma only in the full-time non-traditional-age model. This factor was significant in both step 1 and step 2. One possible explanation for this finding is that because these students were older, they may have been more aware of the economic constraints of their mother's due to their mother's lack of education and therefore were more committed to educational attainment to expand their own life options.

Fifth, having a mother with some college was only significant and positive for the full-time non-traditional-age students in step 2; and this indicates an interaction with the financial variables entered in step 2. These students who had mothers with some college are older students for whom costs, net of aid, appear to have been problematic. Nevertheless, in step 2, they are more likely to persist, suggesting that these older students might have been more goal- oriented and committed to the academic process.

Sixth, older students with mothers who had a college degree were more likely than students whose mothers had only a high school education to persist, in both step 1 and step 2. This suggests a difference in their cultural capital and habitus, such that they may have had a home environment filled with books where learning was encouraged, because they have made the commitment to attain at least the same level of education and life style as their mothers.

Seventh, full-time traditional-age students whose mothers had masters or advanced degrees were more likely than students whose mothers had only high school education to persist. Mothers with masters or advanced degrees were positively associated with persistence at in both step 1 and step 2. This suggests that these students' parents may transmit a more elite cultural capital and habitus and demand college attendance as a requirement for their support.

A consistent pattern regarding the findings about mother's education is that full-time students of traditional-age were more likely to persist when their mothers had more advanced education, while full-time students of non-traditional-age were more likely to persist when their mothers had low to moderate levels of education. The influence of differences in cultural capital and habitus appear to be at work in producing these patterns (Bourdieu, 1997; Paulsen & St. John, forthcoming).

Eighth, being married was positive and marginally significant (.10) only for the full-time non-traditional-age students. Being married was not significant in the initial model or step 1; however, married students became more likely to persist when financial variables were entered in step 2. This suggests that costs, net of aid, may have been problematic for married students of non-traditional-age.

Ninth, having a GED was positive and significant in both step 1 and 2 for the full-time traditional-age sub-group. Students of traditional-age who had been motivated to complete their GED, also appear to have been somewhat more motivated in their commitment to persist in college, compared to students with a high school diploma.

Tenth, being independent was positive and significant only in step 2 of the full-time non-traditional-age student sub-group. Being independent was not significant in the initial model or step 1, but showed a significant and positive association with persistence when financial variables were entered. This finding suggests that older independent students might have experienced higher costs, net of aid, compared to students of dependent status.

Eleventh, being a lower-income student was positive and significant in both step 1 and step 2 of the full-time non-traditional-age sub-group. This indicates that lower-income students were more likely than students with higher incomes to persist. Because there does not appear to be an interaction with financial variables (e.g tuition, aid and living costs added in step 2), it appears that "older," low-income students, who are committed to full-time attendance, possess a special motivation to achieve educational aspirations that will position them for better job market and income opportunities in the future. This findings is not consistent with previous research; however, this is the first study to examine the persistence behavior of older students attending full-time separate from other sub-groups of community college students. Nevertheless, this finding merits further investigation.

College Choice. There were two significant college choice variables in the full-time traditional-age student sub-group and one in the full-time non-traditional-age student sub-group.

First, the effect of choosing a college because of financial aid was negative and significant in step 1 only of the full-time traditional-age student sub-group, and was no longer significant when financial variables were added in step 2. This indicates that those students that chose to attend due to the financial aid offered were less likely than others to persist, apparently because aid was inadequate relative to tuition and living costs for these full-time students of traditional-age. This also suggests that the implicit contract formed between the student and the institution at time of enrollment might have been subsequently violated.

Second, choosing a college to have low living costs was positive and significant in both step 1 and step 2 in the full-time traditional-age student sub-group. Those students who chose to attend a community college in order to have low living costs were more likely than others to persist. These students of traditional-age may have been geographically constrained, as either young adults with work or family responsibilities or youths who lived with their parents at home. This finding supports the notion that community colleges are truly local or neighborhood institutions, and critical points of access to higher education. It is also noteworthy that this pattern of findings is the same as that found in the overall full-time student sample. Because this pattern was not present in the sample of full-time students of older, non-traditional-age, it appears that this pattern in the overall full-time sample as indeed due to the success of younger or traditional-age students in choosing colleges to better manage or control their living costs.

Third, choosing to attend because they could work was positive and significant in step 1 only of the full-time non-traditional-age sub-group. For these older, full-time students, choosing to attend a community college because they could work had a significant and positive association with persistence in the initial model. But this factor was no longer significant when financial variables were entered in step 2. The suggests that older students who chose community college because they could work were more likely to persist because either their earnings from their job helped them pay the direct costs of attending or these older students might have had lower tuition and living costs.

These findings regarding the college-choice variables provided insight into indirect effects that financial factors had on students' subsequent persistence decisions, as a result of their earlier, effects on students' choices of colleges to attend. The calculations students made about where to go to college and how to pay for college had a direct effect on their ability to persist. Furthermore, these types of college-choice decisions interacted with the ways students responded to the actual amounts of both their fixed and controllable costs of attendance. The nature of such interactions are considered at more length in chapter five.

College Experience. There are two significant college experience variables in the full-time traditional-age student sub-group and two in the full-time non-traditional-age student sub-group.

First, being a freshman was positive and significant in the full-time non-traditional-age sub-group at a marginal level of significance of .10 in step 1 and at a .05 level in step 2, indicating that older freshman students are more likely than sophomores to persist. This finding is quite consistent with prior studies of community college students' persistence (Hippensteel et al., 1996; St John & Starkey, 1994).

Second, it is noteworthy that this same finding was observed in the overall part-time student sample. This indicates that students who are non-traditional in their attendance (part-time) and in their age (23 and older) are more likely than other groups to persist in their freshman year, but less likely to persist in their sophomore year. This finding would be favorable for students seeking to complete a one-year program, but unfavorable for those who seek completion of a two-year program. Furthermore, the former is especially promising, and the latter more disturbing, because part-time and older students are also the most sensitive to increases in tuition and other costs in their enrollment decisions.

Having college grades of less than "C" was also positive and significant at the .01 level in both step 1 and step 2 of the full-time traditional-age sub-group. Students with less-than-C grades were more likely than students with "B" averages to persist. Similarly, among older students, those with mostly grades of "C" were more likely to persist than students with "B" grades. In all likelihood, these students were more likely to persist because college policies often made it difficult for students with lower grades of less-than-C or "C" averages to return or re-enroll after dropping out with poor grades. Furthermore, students with B grades would have had more exit options, such as transfer or stop-out, because of their stronger academic standing.

Aspirations. There are two significant aspirations variables in the full-time traditional-age student sub-group and one in the full-time non-traditional-age student sub-group. In general, aspirations has an inverse relationship with persistence, in both models or steps of the two sub-groups.

First, aspiring to attain a vocational degree or some college were positive and significant in both step 1 and step 2 of the full-time traditional-age student sub-group. Students with aspirations of attaining a vocational degree or some college were more likely to persist than those who aspired to attain a college degree. This pattern of findings suggests that students with lower levels of educational aspirations were more likely to persist, perhaps because their goals were more immediate or short-term in nature, while students who had longer-term aspirations were more likely to drop out, possibly in preparation for transfer to an institution where their longer-term aspirations could be realized. It is noteworthy that this pattern was also observed in the overall full-time sample. It is clear that this pattern appears to particularly characterize full-time students of traditional-age.

Financial Variables. There were four significant financial variables in the full-time traditional-age student sub-group and three in the full-time non-traditional-age student sub-group. First, grants (fixed cost) had a direct negative effect on persistence in step 2 of both sub-groups. This indicates that the average grant award was insufficient to cover the direct costs of attending. These findings are consistent with other NPSAS:87 studies (Hippensteel et al., 1996; St. John & Starkey, 1994). This may have been a result of the decline in Pell grants, the tuition growth (tuition growing faster than inflation), the failure of states to invest in education due to a decline in taxes and the unwillingness of citizens to pay more taxes (Linsley, 1999). In combination, these financial factors appear to be limiting access and opportunity to community colleges.

Second, loans (fixed cost) were positive and significant in step 2 of the full-time traditional-age sub-group, and negatively significant in step 2 of the full-time non-traditional-age student sub-group. This indicates that some full-time traditional-age students who chose to attend community colleges were successful in using loans to cover the costs of attendance. However, for older students attending full-time, results indicate that loan amounts were inadequate to cover their costs. This may have been because older students were faced with more responsibilities, requiring that they make difficult choices between paying living costs and paying for continuing their education.

Third, tuition (fixed cost) was negatively and significantly associated with persistence in step 2 of both sub-groups. Both traditional-and non-traditional-age students attending full-time displayed tuition sensitivity that was consistent with previous research on community college students (Hippensteel, et al., 1996; Rouse, 1994; St. John & Starkey, 1994), which is consistently higher than that for students attending any other type of college (Heller, 1997). For full-time traditional-age students, each $1,000 tuition increase reduced the probability of persistency by 26.6 percent, slightly below that found for the overall full-time sample of 29.5 percent. For non-traditional-age students, each $1,000 tuition increase reduced the probability of persistency by 32.8 percent, slightly higher than that observed for the overall full-time sample. Therefore, although part-time students are much more tuition-sensitive than full-time students, these results show that among full-time students, older students are more price sensitive than younger students.

Fourth, controllable costs of food and housing were negative and significant in step 2 in the full-time traditional-age sub-group, with each $1,000 increase reducing the probability of persistence by 18 percent. Full-time students of traditional-age are very sensitive to living costs. However, results indicated that older students were not significantly affected by living costs, perhaps because these students are more mature and skilled at planning for and managing such costs. Because the effects of living costs on the persistence of community college students has never been studied before, this finding offers an important foundation for future research in this area. In combination, the addition of financial variables in step 2, resulted in substantial improvements in all goodness-of-fit measures. The pseudo R squared increased from .1219 to.2357, for the traditional-age sample and from .1576 to .2779, for the non-traditional-age sub-sample. The Somer's D, increased from .354 to .527 for the traditional-age model and from .436 to .506 for the non-traditional-age sample. The -2 Log L also decreased by a substantial amount for both samples.

Analysis of Non-Traditional-Age Part-time Community College Students

In Table 4, only the two steps of one model are presented for the part-time non-traditional-age community college students. The sub-sample of part-time traditional-age students did not converge due to the small sample size.

The first column of numbers presents the Delta P statistics for the initial model or step 1 and included all variables measuring aspects of student background, college choice, college experiences, and aspirations. The second column of numbers shows the Delta P's for the model two or step 2 of persistence, where financial variables of grant amounts, loan amounts, work-study amounts, tuition amounts, and food and housing amounts have been added. Next to each numeric result that is significant at either the .01, .05, or .10. level, the appropriate number of asterisks are shown, according to the legend shown below the line of Table 4. Overall model statistics are also presented, including the Baseline P, Somer's D, Model N, Pseudo R squared, -2 log likelihood for each step.

In general, the findings for this sample of non-traditional-age students attending part-time are very similar to those for the overall part-time sample; the one major consistent difference is that the size of some of the Delta P's are larger for the results presented in this section, that is for older, part-time students.

Table 4

Logistic Analysis: Non-Traditional-Age Part-Time Community College Students

Factor/Variable	Step 1 Delta P N-Trad. PT	Step 2 Delta P N-Trad. PT
Background:		
Ethnicity		
African Amer.	0.09849**	0.11333***
Latino	0.06054	-0.00364
Asian	-0.26303**	-0.33585***
Gender		
Male	0.00895	0.02173
M. Education		
less than H.S.	-0.12173***	-0.14053***
some college	-0.04942	-0.08207*
college	-0.00887	-0.02493
master's	0.06751	0.01759
advanced	0.00644	0.00221
Age	-0.00216	-0.00334*
Married	-0.00216	-0.02137
H.S. Exp.:		
GED	0.05202	0.08501**
No H.S. Dip	0.09834	0.08297
Employment:		
working	0.06132	0.01381
Dependency:		
Independent	-0.00376	0.00780
Income Levels:		
lower	-0.03887	-0.02415
up-middle	-0.00826	0.00765
upper	0.09935*	0.10006
College Choice		
Fixed Costs		
Fin. Aid	-0.01044	0.06056
Low. Tuition	-0.02834	-0.00741
Tuit. & Aid	0.09799**	0.13099***
Cont. Costs		
Living costs	-0.10442	-0.05415
could work	-0.02695	-0.03691
Liv. C & work	-0.01813	-0.03003

Table 4 Continued

Factor/Variable	Step 1 Delta P N-Trad. PT.	Step 2 Delta P N-Trad. PT.
College Exp.:		
Years in col.		
Freshman	0.05006*	0.04648
Grades		
< C	0.13606***	0.12277**
mostly C	0.10133***	0.08971**
mostly A	0.08904**	0.09416**
not reported	0.15035***	0.14596***
Aspirations:		
voc	0.06439	0.05009
some college	0.01597	0.01179
master's	-0.03568	-0.02944
advanced	-0.02555	-0.09224
Financial:		
Fixed Costs		
grants $		-0.04061
loan $		-0.03178
work $		-0.08857
tuition $		-0.70384***
Cont. Costs		
food/housing		-0.07142***
Base Line P	0.7209	0.7209
Somer's D	0.302	0.484
Model N	1161	1161
Pseudo R^2	0.0665	0.1551
-2 Log	1300.980	1180.155
Df	33	38

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* = 0.10 level of significance.
** = 0.05 level of significance.
*** = 0.01 level of significance.

Student Background. The student background factors consisted of seventeen variables related to students' social, economic, and educational background. Five of these background variables were significant for this sample.

First, being African Americans was positive and significant in both step 1 and step 2. African Americans were more likely to persist than other-race students among the older, part-time students. As noted in discussing the findings for the overall part-time sample, African American students have found ways, more than any other groups, to be successful and persistent through a part-time pattern of attendance.

Second, being Asian is negatively associated with persistence in both step 1 and 2. Part-time attendance for Asians--albeit less so for older than for younger students--appears to pose substantial barriers to persistence toward educational attainment. It is possible that their less successful experiences may be due to language and related cultural barriers that are not being adequately addressed by community colleges.

Third, part-time non-traditional-age students with mothers who had less than a high school education were less likely to persist than students whose mothers had a high school education, in step 1 and step 2. This suggests that these older students, attending part-time has many life challenges and responsibilities, so that it was not possible for them to maintain college attendance as a high priority. This does not imply that they, place a low value on education. Instead, it is more likely that they had many other responsibilities to which they had to assign a higher priority.

Fourth, having a GED was not significant in the initial model, but became significant and positive when financial variables were entered in step 2. This suggests that students with GED may have experienced costs, net of aid, that were problematic.

College Choice. One variable in the college choice category was significant. Choosing a college because of both the aid available and low tuition was positive and significant in both step 1 and 2. These older, part-time, students are the most sensitive to tuition increases of all the groups studied (see below). Therefore, it is not surprising that those students in this group, who chose their college in order to minimize their net (tuition minus aid) costs, were significantly more likely to persist. In other words, the cost-consciousness of these students when they chose their colleges proved to serve them well.

College Experience. There were three college experience variables that were significant. First, part-time, older students with grade averages of less- than-"C" or mostly "C" were more likely to persist than those students with grades of "B" average. This indicates that these students were very committed and understood that they may not be allowed to return (re-enroll) if they drop out, due to college policies regarding re-admission for those students with low grades or poor academic standing. Second, students with mostly "A" grades were also more likely to persist than those with grades of "B", suggesting that part-time, older students with grades of "A" experienced more satisfactory levels of academic integration and even attention from instructors encouraging them to persist.

Financial. Tuition and living (food and housing) costs were the only two financial variable that were significant for part-time older students. Tuition was negative and significant and had a substantial direct negative influence on persistence by these part-time older students that attend community colleges. Each one thousand dollars of tuition increase reduced the probability that a student would persist by 70.4 percent, somewhat larger than the magnitude for all part-time students which is understandable because this sample includes only older part-time students who were also found to be more price sensitive than younger students among full-time attendance. Finally, living costs also had a significant and negative effect on persistence; however, older part-time students are considerably less sensitive to change in living costs than to tuition. This is understandable because older students have more control over living costs than over their tuition costs.

Conclusion

This study has examined the nexus between college choice and persistence at community colleges. The study had several findings which, in combination, have implications for community college administrators, enrollment management personnel, financial aid officers, state and federal financial-aid policy makers, as well as for researchers in the area of college choice and persistence.

Chapter five presents a summary of findings for each of the research questions of the study, implications of central findings for the advancement of theory, implication for public policy regarding the promotion of access and persistence at community colleges, suggestions for further research in this area, and some concluding comments.

CHAPTER FIVE

Introduction

During the period from 1965-2000, the United States experienced phenomenal growth in the number of students attending postsecondary education, particularly at the community college level. Community colleges grew from a total of 654 colleges in 1965, to more than 1,350 today, constituting over 40 percent of all institutions of higher education (Adelman, 1992). Community colleges today enroll over 50 percent of all first-time college freshmen and over 37 percent of all students enrolled at all levels of postsecondary education (Adelman, 1992; Grubb, 1995a). This has established community colleges with distinguishing features of accessability and versatility, having something for everyone and preparing students for immediate employment which yields substantial individual and societal gains (Geske & Cohn, 1998; Paulsen, 1998).

In spite of these gains, there has been an evolution in federal aid policy within the past two decades that shifted the emphasis in the way the federal government financed higher education from grant aid to loan aid. At the same time, tuition charges since 1980 have consistently increased at a rate greater than that of inflation, and the need for aid has also grown at a rapid pace, while family income grew slower than the cost of education. State support for higher education wavered due to troubled state economies, resulting in a decline of grants and loans in real terms relative to cost of education. As a result, higher education administrators reacted to this policy shift by spreading the burden to students and their families, diminishing the role of the former policy in promoting student access to postseconday education (Frances, 1990; Hauptman, 1990a; McPherson, & Schapiro, 1989; Paulsen, 1991, 1998; St. John, 1991).

With family incomes growing slower than the cost of education, particularly for the lower- and middle income groups, students from all income groups are increasingly utilizing community colleges as their access points for higher education, because it is more affordable when compared to four-year colleges. This has resulted in the phenomenal growth of community colleges. When the cost of attending a traditional four-year college is compared to the cost of a community college, community colleges became more attractive and more affordable in terms of cost for many families. However, these higher costs still made attendance at community colleges less attractive and less affordable for the lower-income and minority students who had already been the most likely group to attend such colleges. And this has served to defeat the role of community colleges as the most productive points of entry and access to postsecondary education for lower-income and minority students. The reduction in the affordability of attendance at these institutions, due to increased costs, is of tremendous importance and threatens society's commitment to postsecondary opportunities for all individuals and groups.

Over the past two decades, most of the relatively small amount of persistence research conducted on community colleges has focused on within-year persistence of traditional-age and non-traditional-age students (Hippensteel, et al., 1996; St. John & Starkey, 1994). No persistence research has focused specifically on the financial nexus between college choice and persistence for community college students. This was the first study to examine the effects of financial factors on student's college-choice decisions and on their subsequent persistence decisions, in combination with the effects of actual dollar amounts of financial variables, including living costs, on the student persistence behavior of community college students. Furthermore, this is the first study to separately examine persistence behavior separately for full-time, part-time, and traditional and non-traditional-age full-time and traditional part-time sub-groups of community college students.

Using the NPSAS:87 national data base, this study examined the influence of student background, high school experience, college choice, college experience, aspirations, and financial variables on persistence of community college students as they negotiated the financial nexus between college choice and persistence.

Logistic regression was used as the statistical method due to the dichotomous nature of the dependent variable. This method has been used in a variety of persistence studies (Hippensteel et al., 1996; St. John & Starkey, 1994; Paulsen, St. John & Starkey, 1995; St. John, Paulsen, & St. John, 1996), and the Delta-P conversion provided a meaningful measure for purposes of comparison across sub-samples studied.

Summary and Interpretation of Findings

This study was designed to examine four specific research questions. The following section will address each of these questions.

Research Question One

> What is the effect of the importance of financial variables at the time of a college choice decision on subsequent persistence decisions of community college students?

The effects of the importance of financial variables at the time of a college choice decision on subsequent persistence decisions of community college students were: (1) In the overall full-time sample and the full-time traditional-age sub-sample, those students who chose to attend a community college because of low living costs were more likely than others to persist. (2) In the overall full-time sample and the full-time non-traditional-age sub-samples, those students who chose to attend community colleges because they could work were more likely than others to persist. (3) In the overall part-time sample and the part-time non-traditional-age sub-sample, those students who chose to attend a community college because of the low tuition and aid available were more likely than others to persist.

This study clearly shows that full-time students of traditional and non-traditional-age are the groups of students with the least sensitivity to tuition. This is evident from their Delta P's which were substantially lower than those for part-time students. The magnitude of the tuition-sensitivity of full-time students is quite consistent with other studies of community college students (Hippensteel et al., 1996; Rouse, 1994; St. John & Starkey, 1994). Because the full-time students were less sensitive than part-time students to tuition changes, it seems appropriate and understandable that full-time students who chose their colleges because of low living costs and being able to work (controllable costs) would be more likely to persist. However, because part-time students are highly tuition-sensitive, it is not surprising that part-time students who chose their college because of the low tuition and aid available were more likely to persist. In other words, full-time and part-time students chose their colleges for reasons that were consistent with their degree of tuition-sensitivity and these financial reasons for college choice made them more likely to persist.

Research Question Two

> What is the effect of the actual dollar amounts of financial variables at the time of a subsequent persistence decision on persistence of community college students?

The effects of the actual dollar amounts of financial variables at the time of a subsequent persistence decision of community college students are: First, the overall findings--for all samples show that for each $1,000 increase in tuition, the probability of persistence decreased. However, one of the most striking findings of this study involves the substantial difference between the tuition-sensitivity between full-time and part-time students. On average, each $1,000 increase in tuition reduced the probability of persistence of full-time students by only 29.5 percent, while the probability of persistence for part-time students on average was reduced by 68.6 percent. Furthermore, among both full-time and part-time students, those of non-traditional-age were somewhat more tuition-sensitive than students of traditional-age. These findings are especially noteworthy because this is the first study to examine the tuition-sensitivity of community college students separately for full-time versus part-time and, within these broader groups, the traditional versus non-traditional-age students. Therefore, the results of this study provide a foundation for future research on the tuition-sensitivity of similar sub-groups of students.

Second, grant amounts, for students in the overall full-time sample, full-time traditional-age student sub-sample and full-time non-traditional-age student sub-sample were negative and significant. Hence, each $1,000 increase in grant amount is associated with a lower probability that the otherwise-average student would persist. This does not mean that more grant aid reduces persistence, instead it indicates that grant amounts were insufficient to cover costs (Fine, 1998; Hippensteel, et al., 1996; Paulsen & St. John, 1997).

Third, loan amount was positive and significant for the full-time traditional-age student sub-sample, and negative and significant for the full-time non-traditional-age students. One explanation for these different findings would be that full-time traditional-age students are more likely to be upper-income students, less averse to loan, thereby borrowing more money to finance their college education. However, students of non-traditional-age were likely to be more averse to loans and borrow less money to pay for college.

Fourth, for the overall part-time sample and the part-time non-traditional-age sub-sample, grant and loan amounts were not significantly related to persistence. This finding is not surprising given the ineligibility of part-time students for need-based grants and subsidized loan programs. Fifth, based on the overall full-time and part-time samples, part-time students are somewhat more sensitive than full-time students to living costs (food and housing). However, among full-time students, those of traditional-age are highly-sensitive to living costs, while such costs are not related to persistence for non-traditional-age full-time students.

Fifth, part-time students of non-traditional-age were more sensitive to living costs than their traditional-age counterparts. These findings are especially important because this is the first study to examine the responsiveness of community college students to living costs such as food and housing expenses and therefore, provides a foundation for future research with other sub-samples of students.

Finally, for all five sub-samples studied, the overall goodness-of-fit measures--Pseudo R^2, Somer's D, and -2log L-improved substantially and significantly when the financial variables were entered in step 2 (See Tables 2, 3, and 4 in Chapter Four).

Research Question Three

> What is the nature of the interaction between college-choice and financial variables in the persistence of community college students?

The nature of the interaction between college-choice and financial variables can be observed whenever a college-choice variable present in step 1 (the initial model) changes its significance when the financial variables are added in step 2 (the financial model). The substantial improvement in all goodness-of-fit measures between steps 1 and 2 indicate that the estimates of the effects of college-choice variables on persistence were likely to be more accurate in the financial model (step 2), when all five financial variables are included. If one (or more) of the financial variables excluded from the initial model is correlated with both a college-choice variable (included in the model) and with persistence, then the estimates of the effects of college-choice variables in step 1 are characterized by omitted relevant variable bias (Kmenta, 1986).

The estimate for a college-choice variable in step 1 could be either downward or upward biased, depending on the nature of its interaction with one or more of the financial variables. The direction of bias (upward or downward) can be discerned by observing whether the estimate became more negative (an upward bias in step 1) or more positive (a downward bias in step 1) when the financial variables were added in step 2.

One example drawn from the results for the overall full-time sample in this study will be discussed here to illustrate the "nature" of such interactions. In the overall full-time sample (see Table 3), the effect of choosing a college because one "could work" has a positive and significant estimate in step 1, but falls to a non-significant estimate in step 2. Clearly, there is evidence of interaction between the "could work" choice variable and one (or more) of the financial variables added in step 2.

The estimate on the "could work" variable in step 1 clearly had an upward bias, and all three financial variables that were significant in step 2 had negative signs, therefore one (or more) of the financial variables had an inverse relation to the "could work" choice variable. This means that when a financial variable, like tuition or living costs, was excluded from the initial model, its effect on persistence might have upwardly-biased the estimate on the "could work" choice variable in step 1. If living costs were actually responsible for the upward bias in step 1, then students who chose a college because they could work would tend to have had lower living costs than other students; thereby reflecting the inverse relation between living costs and "could work", as well as explaining the upward bias in the estimate on "could work" in step 1, a bias that was reduced when the separate effects on persistence of living costs (and the other financial variables) were partitioned out and a more accurate estimate for "could work" was produced in step 2--the financial model.

The explanations and nature of interactions based on estimates with downward bias are quite parallel in logic, but the direction of effects, changes and interactions would be reversed. There are seven instances of such interactions between the college-choice and financial variables in the five samples for which the model was estimated in this study, each of which demonstrates the presence of substantial interactions between college-choice and financial variables, and each of which illustrates the nature of such interactions.

Research Question Four

> What are the effects of selected background, college-experiences, and postsecondary aspiration variables on the persistence of community college students?

The most central findings regarding the effects of selected background, college-experiences, and postsecondary aspirations are:

Ethnicity. First, being African-American was significant and positive in the overall part-time sample and part-time non-traditional-age sample. Thus, African-Americans were more likely than Caucasians to persist when attending on a part-time basis. This finding suggests that African Americans, more than any other group, have found ways to be successful and persistent through part-time attendance. For some, this may be because their social economic status, early home environment and habitus had forced them to learn to juggle many life challenges and responsibilities including the necessity of maintaining a job that makes school attendance possible. Thus, a part-time pattern of attendance would be consistent with their greater ability to persist. Being Latino was significant and negative in the overall full-time sample and the full-time non-traditional age sub-group. In addition, Asians were less likely than Caucasians to persist across all samples studied. For Latinos and Asians, being less likely to persist may be a result of language and cultural barriers.

Mother's Education. Students whose mothers had less than a high school degree were less likely than students whose mothers had a high school degree to persist among part-time students in the overall sample and part-time non-traditional-age students. This suggests that part-time students of non-traditional-age whose mothers had less than a high school education had many other life challenges and responsibilities, so that it was not possible for them to maintain college attendance as a high priority. This does not imply that they place a low value on education. Instead, it is more likely that they had many other responsibilities to which they had to assign a higher priority.

On the other hand, students whose mothers had less than a high school degree, but attended college on a full-time basis in the overall full-time sample and the full-time traditional-age sample were more likely than those whose mothers had a high school diploma to persist. This suggests that full-time students of traditional-age whose mother's had less than a high school education might have experienced their mothers who may have had fewer opportunities and options for economic survival or advancement, which may have heightened their likelihood of taking advantage of educational opportunities and expanding their own life options.

High School Experience. Students with GED across all sub-samples, except non-traditional-age full-time, were more likely to persist than students with a high school diploma. This may be because they were used to the discipline and structure of education as a result of their preparation for their GED. Apparently, these students could readily see the potential of increased earnings compared with the opposite outcome of being on welfare. This is one of the many reasons why community colleges serve an important role in providing opportunity and access for higher education.

College Experience. Students with grades that were either less than "C" or mostly grades of "C" were more likely than student with "B" grades to persist across all sub-sample groups. This maybe because students with "B" grades were better positioned for exit options, such as transfer to a four-year institution due to their stronger academic performance or stop-out temporarily. Another possible explanation for this finding is that institutions have policies in place that will automatically dismiss students or place them on probation with grade point average of less than "C" per semester, and re-admission after dropping out with poor academic standing is problematic. Consequently, the policy serves as a motivational factor to those students that are committed to the educational process and desire an increased earning potential. This is another one of the reasons why keeping community college tuition affordable will benefit society as a whole in the long-term. In order for institutional policies to motivate students to persist with low grades, the student must first be able to pay the price of access to the community college.

Aspirations. Students who desire to attain a vocational degree and obtain some college were more likely than those aspiring to a college degree to persist in the overall full-time and full-time traditional-age samples. In other words, students who had more short-term educational goals--especially those that could be readily attained at a community college, were more likely to persist than students with goals that could only be achieved through transfer to another college or university. Therefore, access to community college is very important for students with more short-term educational goals.

Advancement of Theory

One of the most important sets of implications based on the findings of this study are related to the fact that this study is the first to investigate a number of important phenomena related to the ways in which community college students respond to financial and other factors in their enrollment (choice and persistence) decisions. In particular, this study was among the first group of studies undertaken to examine the financial nexus between college choice and persistence, and it was the very first to examine the financial nexus between choice and persistence as experienced by community college students. This study was also the first to examine the effects of living costs (housing and food) for community college students in general, and for sub-samples based on attendance pattern and age. Furthermore, this was the first study to estimate the effects of college choice and financial variables-as well as student background variables--on persistence separately for sub-samples of community college students divided into groups of full-time and part-time, traditional-age and non-traditional-age full-time, and traditional-age and non-traditional-age part-time students.

Because this study has sought to address a number of gaps in the literature on the college choice and persistence behavior of community college students, its findings in a number of important areas can serve to advance theory, and even more importantly, to serve as a foundation for the conduct of future research in these areas. Therefore, the following list of tentative conclusions, each based on findings from this study, can be offered as "potential" advances in our theoretical understanding of the choice and persistence behavior of community college students, especially in the area of their responsiveness to financial factors. More precisely, the following tentative conclusions can be viewed as a set of testable hypothesis that can serve as starting points or guides in the conduct of future research:

(1) College-choice variables have significant effects on the subsequent persistence decisions of community college students. In particular, students who chose their colleges to have low living costs or because of the low tuition and financial aid available, are more likely than others to persist.

(2) Interactions between college choice and financial variables are significant and occur across a variety of sub-groups of community college students. In other words, students who rate specific financial reasons as "very important" in their choice of college to attend are also differentially responsive to the actual dollar amounts of financial variables at the time of subsequent persistence decisions.

(3) Different college choice variables lead to successful educational attainment for full-time and part-time students. In particular, full-time students who choose their colleges in order to have low living costs are more likely than others to persist. Part-time students who choose

their colleges because of the low tuition and financial aid available are more likely than others to persist. In combination with other findings, this can be restated to say that full-time students, who are the least tuition-sensitive, are better off when they choose their colleges to have low living costs; while part-time students, who are the most tuition-sensitive, are better off when they choose their colleges because of the low tuition and financial aid available.

(4) Tuition-sensitivity for full-time community college students is substantial, but still moderate; however, the tuition sensitivity for part-time community college students--which has never been estimated before--is more than twice that of full-time students.

(5) Among both full- and part-time students, non-traditional-age students have somewhat higher tuition-sensitivity than traditional-age students.

(6) Grant amounts are inadequate to cover the costs of attendance for full-time students, but are not significantly related to persistence among part-time students.

(7) Loan amounts are neutral in their effect on the persistence of part-time students; however, among full-time

students, loan amounts increase the likelihood of persistence for those of traditional age and decrease the likelihood of persistence for those of non-traditional age.

(8) Living costs (housing and food) have a negative effect on the persistence decisions of community college students; however, among full-time students, those of traditional age are the most sensitive to living costs out of all sub-groups, while living costs do not have a significant effect on students of non-traditional age.

(9) African Americans are more likely than other-race students to persist and be successful through a part-time attendance pattern.

(10) Latino students attending full time are less likely than Caucasians to persist; while Asian students are less likely than Caucasians to persist among full-time, part-time and traditional- and non-traditional-age student groups.

(11) Among part-time students, those whose mothers have less than a high school education are less likely to persist than those whose mothers have a high school diploma. However, among full-time students, those whose mothers have less than a high school education are more likely to persist

than those whose mothers had a high school diploma.

(12) In general, community college students with GED's are more likely to persist than students with high school diplomas, among full-time, part-time and traditional- and non-traditional-age student groups.

Implications for Public Policy

Findings from this study have implications for policymakers who are involved at all levels-federal, state and institutional-in the public financing of higher education, as well as for the counseling process used by financial aid administrators at community colleges.

First, policy concerning federal student aid influences access and opportunities for higher education considerably. During the 1980's, there was a shift in federal aid policy from grants to loans (Lewis, 1989) while tuition rose faster than inflation (Hauptman, 1990). During this same period, public higher education faced cutbacks in state and federal appropriations and support from local communities (St. John, 1991). Institutions had to reorganize themselves to compensate for these changes in the availability of funding. This resulted in many institutions developing pricing strategies that transferred tuition costs to students. The practice of raising tuition without adjusting student grants has become problematic (Hearn & Longanecker, 1985). Such practices violate the philosophy that has been the foundation for financing and pricing education at community colleges for decades. St. John (1991) articulates this philosophy as follows:

> ...The low-tuition/low-aid philosophy assumes that a substantial portion of educational costs should be financed by the taxpayers because they benefit from an educated citizenry ... The low-tuition/high-aid approach is closely aligned with policies advocating universal access (pp. 275-276).

This study found that although student loans appear to be adequate for full-time traditional-age students, they appear to be quite inadequate to cover the costs of college attendance for students in the full-time non-traditional-age sub-group. Loan amounts produced a significant and positive influence on persistence for full-time students of traditional-age. However, the receipt of loans produced a significant and negative effect for full-time non-traditional-age students. A possible explanation for this is that traditional-age students are younger, with less responsibilities, are more likely to be from higher income backgrounds, and are more eager to take out loans for their college education; while non-traditional-age students are older, already have many responsibilities of mortgages, childcare bills, are less likely and willing to take out loans for their education, and are more afraid of dealing with the debt that will result from this practice.

There is a great need for community college students to be provided with strategies for dealing with debt that could result from the practice of taking out loans, and counseling that will provide an increased understanding of what loan default could mean. Students that are confronted by growing levels of debt could choose to drop out, which means that they would have to go into repayment, a situation that many may not be able to afford, and therefore, such students will probably have an increased probability of default. However, those who persist and realize a level of debt that is too high relative to their expected earnings after college may also have an increased probability of defaulting. Such loan defaults could ruin the lives of these students, especially in the sense that the improved quality of life for which the education was purchased will be lost for those that default, again defeating the goals of those seeking a life style better than their parents, and defeating the goals of access and success for students from all backgrounds that have characterized the American community college. Therefore, student aid counseling can help students to better understand the broader ramifications of borrowing and assist them in contending with the difficulty of such conditions. To promote access for this sub-group of students of non-traditional age who are attending full-time, special need-based-grants should be made available to promote free education at this level.

Second, this study also found that grant amounts were inadequate to cover the costs of attendance for full-time students, both those of traditional and non-traditional age. This is especially significant for minority and low-income students because it further limits access and opportunity to these students for whom higher education is already the least accessible. Inadequacy of grants to cover the cost of college attendance has the greatest effect on minority and low-income student enrollment, because they are more sensitive to costs than other groups (Heller, 1997; Paulsen, 1998). In order for community colleges to curb or prevent the erosion of minority and lower-income student attendance, compensation for the loss of grant dollars should be made through the form of federal, state, or institutional grants (St. John & Noell, 1989). As explained by St. John, "large cuts in the Pell program could seriously impair access unless state grants were used to make up some of the differences" (St. John, 1991, p. 279). Of course, a return to the previous (1970s) growth in Pell grant amounts relative to tuition expenses might be the most effective policy of all, even if it appears politically impractical or not achievable.

Third, based on this study, findings indicate that all groups of community college students are very sensitive to tuition, far more sensitive than students attending any other type of higher education. And even though full-time students are only moderately more tuition-sensitive than students at public four-year colleges, part-time community college students are substantially more tuition-sensitive than any other group of students, even among community college students. This strongly suggests that policymakers at all levels must make certain that it is not necessary for community colleges to raise their tuition. Indeed, the findings of this study regarding tuition-sensitivity of community college students, especially for the many part-time students, offer a compelling argument for financing the attendance of community college students with demonstrated need on an entirely different basis than that used to shape pricing at four-year institutions. State appropriations that offset the lack of property taxes and other non-tuition revenues, along with full-cost entitlement grants are requisite to providing open access for students of need at community colleges.

Community college students are very cost-conscious in their choice of college to attend. The majority of community college students in this study indicated that the low tuition charges, the availability of student financial aid, or both of these were very important in their decisions to enroll. However, some of the positive effects of choosing community colleges because of the relatively low cost of attendance were mitigated both by the high costs of attending and the fact that aid packages were inadequate. Therefore, judging by the results of this study, the implicit public "covenant" that was made to prior generations--that the state would provide a public higher education affordable to the lower and middle classes-has not been upheld. However, the agenda of the Congress today is focused in reducing social programs, and it appears highly unlikely that federal student aid--and federal grants in particular--will be protected. These changes could be detrimental to access and opportunity offered through community colleges, and the participation of lower-income and minority students could be further reduced, unless states find ways of raising new money and adjusting to these conditions.

A straightforward solution for community colleges, in keeping with their philosophy of being an access institution and providing opportunity and wider access to higher education, would be to follow a low-tuition/high-aid strategy (Mumper, 1996). Providing an alternative form of Pell-grant-like program for students, such as grants and work would promote greater access for those students that ordinarily would not apply for loans. Such a plan would also be essential to further the education of those whose grant amounts do not cover the full cost of attendance-including living costs, which have been sadly neglected in the formation of federal, state, and institutional policies (Paulsen & St. John, 1997; St. John, Paulsen & Starkey, 1996). This may be difficult, because state and public support may be lacking in terms of willingness to pay higher taxes. However, serious efforts must be made to educate the public by increasing the awareness of the benefits received by communities and industry, as a direct result of investment in state and local community colleges. If citizens understood the social benefits of investments in financial aid, they may be more willing to support policies that could enhance student aid availability (Bowen, 1977; Paulsen, 1996a, 1996b). It is evident from this study, that financial aid policy must be redesigned to better meet the needs of a more diverse student population attending community colleges.

This study also suggests a re-examination of the state funding policy because financial aid and grants are not keeping up with tuition increases. Grant aid has failed to keep up with rising cost of tuition, community colleges are now forced to depend on student loans, which decreases the access for the lower-income and minority students in general.

Based on the findings, this study recommends a free and universal education for lower-income students for a defined period of time to higher education. This will promote access and opportunities for the lower-income groups and may be successful in promoting growth and development in local communities and states (Paulsen, 1996a, 1996b).

Another state policy issue that arose from this study is that of financial aid eligibility in general. The issue of grants was previously mentioned, that students enrolled as part-time students are very much less likely to receive loans, scholarships, and other forms of financial aid when compared to their full-time colleagues. Based on this study, 44.3 percent of males and 55.7 percent of women at community colleges attend on a full-time basis, while 41.7 percent of males and 58.3 percent of females attend on a part-time basis. This study further indicates that part-time students receive less aid than full-time students, but that part-time students are far more sensitive to tuition costs than full-time students. Hence, community colleges must develop new need-based grant aid for the large portion of their students who are part-time students. This program must be based on need, but must not use the same policies and guidelines of

Pell grants to determine eligibility to ensure that it promotes more access for the large and growing part-time student group.

Another finding of this study is that part-time students are very sensitive to the high cost of tuition. The estimated effects of this study regarding the relative effects of tuition, grants, loans, and living costs, on persistence, suggest that decreases in tuition would have a even greater impact on the persistence of part-time students than increases in financial aid and may even shift many of them to full-time status. Do not forget, as mentioned earlier, that these students are less likely to apply for loans for education, and as a result, some of these students might have chosen to attend on a part-time basis to avoid this debt. Therefore, lower tuition, may have an opposite and highly positive effect on the enrollment behavior of part-time students. Community colleges may achieve this by targeting allocations of state funds for these groups (Hearn & Longanecker, 1985).

Implications for Institutions

Given the high percentage of students that are enrolled at community colleges on a part-time basis (41.7 percent males and 59.5 percent females), and given the need for lower-income and minority students to do so, the findings of this study about part-time students become very important. In this study, tuition differentials affect part-time students at a much greater rate than full-time students. This raises a major area of concern, suggesting that institutional leaders must examine the consequences of raising tuition prices, especially for part-time students, giving special consideration to all aspects of student costs--fixed and controllable.

The impact that increases in tuition have on full- and part-time students should be viewed in terms of access. Increases in tuition appears to have strong negative effects on all community college students, but more on part-time students. Educational leaders and policy makers should consider the implications of increases in tuition for access to higher education for highly tuition-sensitive students.

This study also found that social background variables of ethnicity, mother's education, high school experience, and aspirations all influence persistence differently for full- and part-time students, and for students of traditional and non-traditional age. Therefore, college administrators, enrollment management personnel, policy makers, and financial aid personnel, must no longer assume that all students will respond to programs and policies in the same manner.

Older students with families and children are attending community colleges, many on a part-time basis, and have entirely different needs and responsibilities that must be considered in order to maximize their persistence and promote access and opportunity.

Finally, enrollment managers could use the findings of this study to develop a set of differential price-response coefficients for full-time and part-time, traditional-age and non-traditional-age full-time and non-traditional-age part-time sub-samples for the financial variables of tuition, grants, loans, and living costs. These, in turn, could be used to simulate the effects of changes in institutional policies on student enrollment behavior.

Suggestions for Further Research

The first suggestion for further research is to replicate this study based on NPSAS:87 with a current NPSAS data-set, examining the current financial aid trends. It could prove valuable to monitor financial variables for the purposes of addressing the issues of opportunity and access.

A second suggestion that could add significantly to this body of literature is to study the enrollment behaviors of part-time students at community colleges. This is because their behavior pattern is very different from that of the full-time students. Because their behavior is so different, and because this study is the first of any kind to examine this important sub-group at community colleges, using a qualitative approach (interview) to identify the issues that make them different could make a very important contribution to our understanding of their behavior and the reasons for it.

A third suggestion for future research is to examine the behavior of African American students to better understand why they are the only group that are more likely to persist than any other group using a pattern of part-time attendance. There are many challenges that make part-time attendance problematic. Why and how have African American students, more than other groups, been able to better negotiate this path that seem so difficult for other students?

A fourth suggestion is to explore the possibilities of the existence of a multidimensional nexus, with financial, academic and social components. This may best done with an appropriate national database because of the difficulty-or even impossibility-of obtaining market-based measures of a variety of financial factors in an institutional database. Such an inquiry would, of course, not be limited to the study of community college students, but could be expanded to consider a variety of different sub-groups of students to examine their enrollment decision-making behaviors in light of financial, as well as academic and social factors.

A fifth suggestion is for researchers to examine in detail some or all of the twelve specific "tentative conclusions" presented in the earlier section of this chapter on advancement in theory, viewing them as testable hypotheses for future research.

Conclusion

This study has presented the compelling findings that community college students are more cost-responsive, particularly part-time community college students, than students attending any other type of institution. This is very troubling in light of the cost provisions for the federal financial aid programs. During the 1980s, net costs grew for community college students, due to the actual increases in tuition, and federal policies that limited the percentage of costs that could be covered under the federal grants. Consequently, community colleges were forced to increase tuition charges without any considerations given to the impact on students' enrollment behavior (Hauptman, 1990a, 1990b). More public investment is needed through taxes to increase and meet the needs for grants for community colleges.

Sadly, all these developments appear to defeat the real purpose of community colleges, which has been to provide the low-cost postsecondary option for those who could not afford to start college away from home and also providing opportunity and access for a large number of adult students, who are highly price sensitive. If state budgets continue to decrease, resulting in increased tuition for these students, postsecondary opportunities for low-income and minority students will be reduced, thus access to higher education will be eroded. Hence, it is imperative to change or expand student financial aid policies-especially in the area of need-based grants--to better accommodate the needs of all students.

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APPENDIX A

VARIABLE CODING

VARIABLE	CODING
STUDENT BACKGROUND	
Ethnicity	
African American	1, 0
Latino	1, 0
Asian	1, 0
Other	Comparison group
Gender	
Male	1, 0
Mother's Education	
Less/H.S.	1, 0
High School	Comparison group
Some Col.	1, 0
College	1, 0
Master's	1, 0
Advanced	1, 0
Age	
Years Old	Year of age
Marital Status	
Married	1, 0
Independent	1, 0
Income	
below $11,000	1, 0
$11,000-$29,999	Comparison group
$30,000-$60,000	1, 0
Above $60,000	1, 0
High School	
GED	1, 0
No H.S. Dip.	1, 0
H.S. Diploma	Comparison group
Employment	
Working	1, 0

Dependency Status

Independent	1, 0

COLLEGE CHOICE (Perceptions/Expectations of costs)

Fixed Costs

Financial Aid	1, 0
Low Tuition Cost	1, 0
Tuition & Fin. Aid	1, 0

Controllable Costs

Low Living Cost	1, 0
Could work	1, 0
Living Cost & Work	1, 0

COLLEGE EXPERIENCE

Years in College

Freshman	Comparison group
Sophomore	1, 0

Grades

Below C	1, 0
Mostly C	1, 0
B Average	Comparison group
Mostly A	1, 0
Not Reported	1, 0

ASPIRATIONS

Vocational	1, 0
Some College	1, 0
College	Comparison group
Master's	1, 0
Advanced	1, 0

FINANCIAL

Fixed Costs

Grants $	1 = $1,000
Loan $	1 = $1,000
Work $	1 = $1,000

Tuition $	1 = $1,000
Controllable Costs	
Food/Housing $	1 = $1,000

VITA

Loretta Nkeiruka Akosa Mbadugha was born on December 10, 1957, at Onitsha, Anambara State, Nigeria, West Africa. She was educated in the parochial school system through the twelfth grade and graduated from Queen's High School, Enugu, Anambara State, Nigeria, in 1976. In 1978, she was awarded an Associate degree in Secretarial Studies from Langham Secretarial College, London, England. In 1980, she received her Bachelor of Science degree in Public Affairs from Texas Southern University, Houston, Texas. She also earned her Master of Science degree in Health Education from Texas Southern University in 1982 and also earned additional graduate credits in Guidance and Counseling.

She began her career at Texas Southern University as an Administrative Secretary in 1979, and worked her way up as a Program Analyst in 1981. In 1986, she joined the faculty of Southern University in New Orleans as an adjunct faculty member. In 1987, she joined the Young Women Christian Association (YWCA) as Assistant to the Executive Director. In 1992, she created her own successful business named Professional Family Support Services and has remained self-employed ever since as the Chief Executive Officer.

Since 1986, Loretta has been married to Mr. Christian Okechukwu Mbadugha with three children, Kristine Ogechi Chidimma (12 years), Kyle Okechukwu Kelechi (11 years) and Dutches Kelesy Odinak Nkiruka (2 years). Loretta and her family reside in New Orleans, Louisiana.